United States Department of the Interior
Bureau of Land Management

Environmental Assessment
for the
Wadge Seam Coal Lease by Application COC 74219

Little Snake Field Office
455 Emerson Street
Craig, CO 81625-1129

DOI-BLM-CO-N010-2010-0003-EA

April 2012

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ENVIRONMENTAL ASSESSMENT

Chapter 1 – Introduction

1.1 Identifying Information

EA-NUMBER: DOI–BLM–CO-N010-2010-0003-EA

PERMIT/LEASE NUMBER: COC 74219

PROJECT NAME: Wadge Seam Coal Lease by Application

LEGAL DESCRIPTION: T. 5 N., R. 87 W. of the 6th PM
Sec. 22, N½
Sec. 22, NW¼SW¼
Sec. 21, NE¼NE¼

APPLICANT: Peabody Sage Creek Mining, LLC

1.2 Background Information

Peabody Sage Creek Mining, LLC, (PSCM) has submitted a Lease by Application (LBA) for approximately 400 acres of Federal coal located in Routt County, Colorado for the Peabody Sage Creek Mine (PSCM). It is estimated that the Federal coal reserves included in this LBA will total approximately 3.2 million tons of low sulfur, high heating value coal for the PSCM.

Coal has been mined in Routt County for almost 100 years. Coal is a federal asset, and the Bureau of Land Management (BLM) is required by law to consider leasing the federally owned minerals for economic recovery. (*See* Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act (FCLAA) of 1976; Federal Land Policy and Management Act (FLPMA) of 1976; 43 C.F.R § 3400, et seq.) The decision to lease these lands is a necessary prerequisite for mining, but it does not authorize mining. If the BLM decides to lease the Federal coal described in the LBA submitted by PSCM, there will be a competitive sealed-bid lease sale for the tract. The successful lessee must then submit a plan for mining and reclamation to the Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSM), for review and approval. Once a mining plan has been submitted, OSM will review the developments proposed in the mining plan.

This LBA involves leasing underground Federal coal reserves beneath private lands. PSCM owns the surface of the 400 acres. The Colorado Division of Reclamation, Mining and Safety (CDRMS) issued a 5 year permit for the PSCM (an underground coal mine) to Peabody Sage Creek Mining, LLC on August

20, 2010. The surface facilities for the mine are located on private and State owned surface. The coal to be mined from the acres covered by this LBA will be processed at the existing Twentymile Coal Company Foidel Creek Mine surface facilities. The only potential surface disturbance from mining the coal in this LBA will be as a result of subsidence.

Leasing of the 400 acres would enable PSCM to lengthen the 4 gateroads (see Figure 1) and provide a logical extension of PSCM's development of the Wadge seam. Acquiring the lease would lengthen the life of mine and allow PSCM to continue producing coal instead of ceasing production. PSCM would be able to maximize recovery of Federal coal – if the Federal coal in question is not mined by PSCM it will be bypassed and the potential economic recovery will be lost. Extending the life of the mine would allow PSCM to continue to employ the workforce for the additional time required to extract the coal.

The development of this coal reserve is important to both the local economy and the nation. If leased, the coal would likely be used for electrical power generation, but may be used for other industrial purposes. According to the Energy Information Administration, coal is currently responsible for about 50 percent of the total generation in the electric power sector. Leasing the coal allows development of Federal coal resources to meet the public's continuing economic demands for dependable and affordable domestic energy while giving due consideration to the protection of other resource values. As a result of the leasing and subsequent mining and sale of Federal coal resources, the public receives lease bonus payments, lease royalty payments, and a reliable supply of low sulfur coal for power generation.

Unsuitability criteria apply only to surface coal mining, and therefore are not applicable for this LBA.

1.2 Purpose and Need for the Proposed Action

Purpose:

The BLM purpose is to decide whether to hold a competitive sealed-bid lease sale for the tract as applied for, hold a competitive sealed-bid lease sale for a modified tract, or reject the current application and not offer the tract for sale at this time.

Need:

The need is to respond to an application to lease coal in accordance with the National Environmental Policy Act (NEPA), the MLA of 1920, as amended by FCLAA (1976), and FLPMA (1976).

1. 3 Land Use Plan Conformance Review

The proposed action was reviewed for conformance (43 C.F.R. § 1610.5, BLM MS 1601.03) with the following plan:

Name of Plan: Little Snake Record of Decision and Resource Management Plan (RMP)

Date Approved: October 2011

Results: The Proposed Action is in conformance with the Land Use Plan (LUP) because it is specifically provided for in the following LUP goals, objectives, and management decisions as follows:

Allow for the availability of the federal coal and oil shale estate for exploration and development. Objectives for achieving these goals include:

- Identify and make available the federal coal and oil shale estate for exploration and development, consistent with appropriate suitability studies, to increase energy supplies.
- Facilitate reasonable, economical, and environmentally sound exploration and development of the federal coal and oil shale estate.

Section/Page: Section 2.13 Energy and Minerals/ page RMP-36

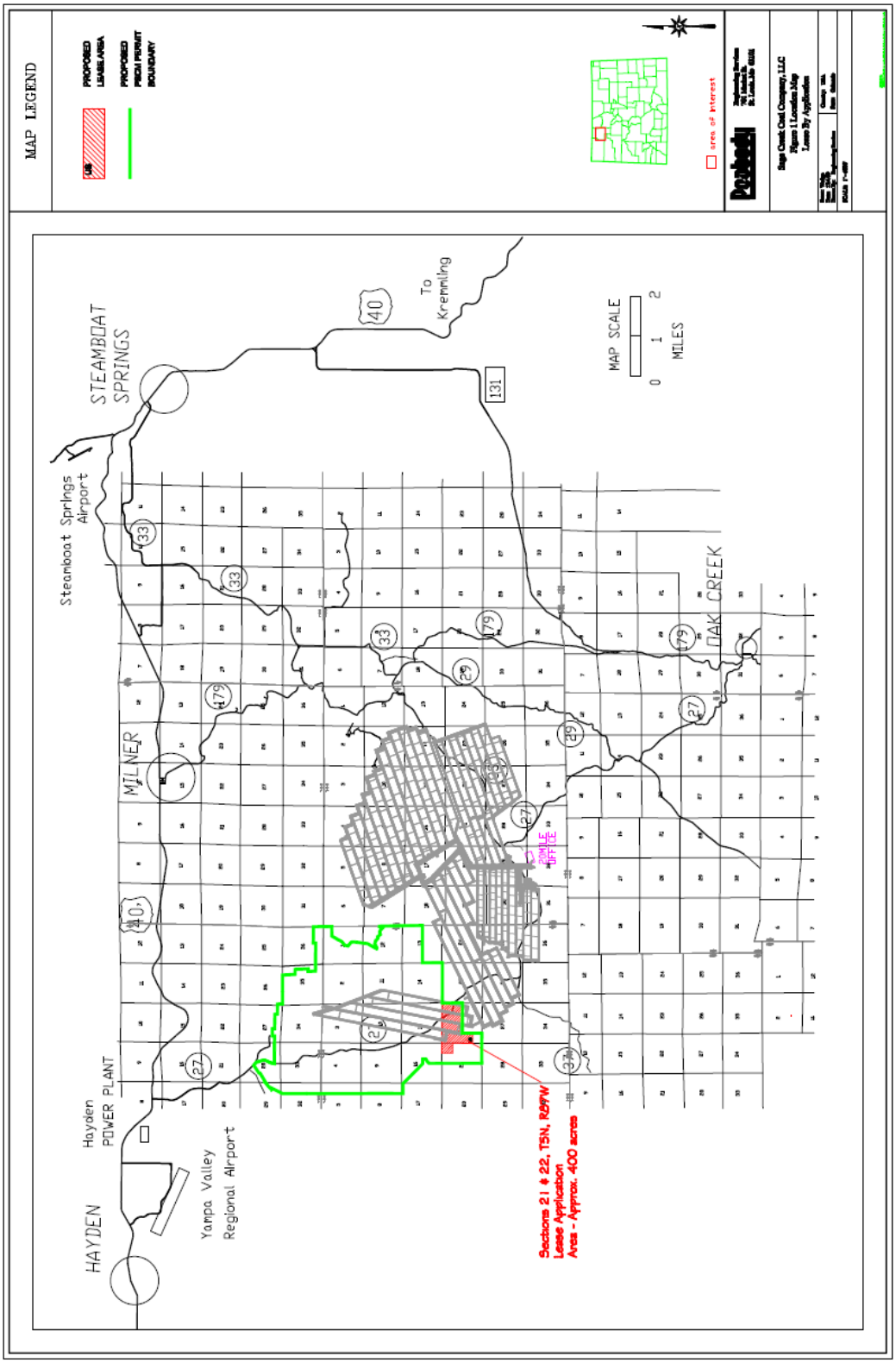
1.4 Public Scoping Process

This project was listed on the Little Snake Field Office's NEPA log and posted on its web site, http://www.blm.gov/co/st/en/BLM_Information/nepa/lsfo.html. While the project was listed on the NEPA log, the BLM received two comments; one from Earth Justice and one from Colorado Parks and Wildlife. The comment from Earth Justice requested that the BLM review and consider Earth Justice's comments on Grand Junction Field Office's McClane Canyon Mine and Cañon City Field Office's New Elk Mine. Earth Justice's letter regarding the New Elk Mine urged BLM to take a hard look at potential impact of the proposed New Elk Mine lease modification on climate change. Specifically Earth Justice noted that BLM must account for the methane that will be released during coal mining of the area from methane drainage wells and the ventilation system. Also, Earth Justice stated the NEPA document must address the impacts of the project on climate change. There will be no methane drainage wells at the Sage Creek Mine; all methane will vent through the mine ventilation system.
EPA's letter stated its concern over unmitigated methane emission associated with the New Elk Mine, and concerns regarding groundwater, surface water, and air quality discussion in the Draft EA for the New Elk Mine.
Earth Justice's letter to the BLM regarding the McClane Canyon Mine lease modification recommended the BLM address the following:

- BLM must describe in detail the proposed action, and the purpose of its various components.
- BLM must disclose how the McClane Canyon Mine lease modification and proposed expansion relate to the proposed Red Cliff Mine.
- BLM should prepare an environmental impact statement (EIS) because the lease modification and proposed expansion may have significant impacts.
- BLM must quantitatively and qualitatively analyze the impacts of the lease modification and proposed expansion of climate change, and the impact of climate change on the baseline environment.
- BLM must consider a range of alternatives and measures to mitigate methane emissions.

The comment from the Colorado Parks and Wildlife (CPW) was that CPW encouraged this project to afford the highest protection for Colorado's wildlife species and habitats in the development of this project.

FIGURE 1: Proposed Federal Lease Area, from Peabody Sage Creek Mine



Chapter 2 – Proposed Action and Alternatives

2.1 Proposed Action

The proposed action is to offer a Federal coal lease at a competitive lease sale. The coal lease is approximately 400 acres of previously un-leased Federal coal administered by the BLM. The lease area encompasses 400 acres of federal coal and 0 acres of federal surface; the surface of the 400 acres is privately owned by PSCM. This 400 acre tract is adjacent to the southern border of the 10,164 acre PSCM permit boundary. There would be no surface facilities, vent holes or shafts constructed on the 400 acres. This lease would be accessed from the PSCM portals and mined by underground methods. This lease would allow PSCM to extend mining of the Wadge seam by providing an extension of the gateroad development.

2.2 No Action Alternative

Under the No Action alternative, the LBA would be rejected; Federal coal would not be leased and consequently, 3.2 million tons of federal coal would be bypassed. The Federal and State governments would not receive money from the lease sale or royalties from the sale of the Federal coal.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

If an alternative is considered during the EA process but the agency decides not to analyze the alternative in detail, the Lead Agency must identify those alternatives and briefly explain why they were eliminated from detailed analysis (40 C.F.R. § 1502.14). An action alternative may be eliminated from detailed analysis if:

- It is ineffective (does not respond to the purpose and need).
- It is technically or economically infeasible (consider whether implementation of the alternative is likely, given past and current practice and technology).
- It is inconsistent with the basic policy objectives for the management of the area (such as, not in conformance with the LUP).
- Its implementation is remote or speculative.
- It is substantially similar in design to an alternative that is analyzed.
- It would have substantially similar effects to an alternative that is analyzed.

Methane Capture
An alternative to capture the coal mine methane (CMM) was considered, but eliminated from detailed analysis because it is technically or economically infeasible and its implementation is remote or speculative. These obstacles include technical challenges, unresolved legal issues concerning ownership of the coalbed methane resource, power prices, and pipeline capacity and quality constraints.

A coal lease does not grant the lessee the right to capture gas released incident to mining. A gas lease must be obtained from the owner of the gas. In the United States, industry lacks a uniform legal framework governing CMM ownership. In most cases, a coal lease holder does not have automatic rights to CMM and must work with the gas lease holder, the surface owner, the government, or a combination of the three to resolve the issue. Ownership issues, which remain a serious obstacle to methane recovery, are largely dependent on whether the CMM resources and rights are controlled by the U.S. Government or if they fall on private lands where ownership of the mineral resources is governed by state laws. If no lease is held for the gas, it may only be vented to the atmosphere for safety purposes as set out by the Mine Safety and Health Administration (MSHA).

The federal government does not own all the gas in the lease application area; most of the gas is privately owned. The gas that is owned by the federal government would have to be acquired through a competitive lease sale under the Minerals Leasing Act. There is no guarantee that PSCM would be the highest bidder on the gas lease. At the present time, there are no valid existing oil and gas leases or pending lease applications for the project area.

All of the methane from the 400 acre lease and from the mine can be vented through the mine ventilation system efficiently; the lease does not contain enough gas for a degasification well. Additionally, a degasification well may require surface disturbance, which would cause environmental impacts. There is no surface disturbance associated with the proposed action. Currently, there are more than 1,000 underground coal mines in the U.S. There are presently only 14 coal mine methane recovery and utilization projects at active underground coal mines (Environmental Protection Agency (EPA) Coalbed Methane Outreach Program (CMOP), 2011).

Practical constraints on commercial development of methane or natural gas in this area include the depth of the resource, the occurrence of the resource, resource quality and quantity, and limitations relative to effective resource development and production and the mine life.
EPA's Identifying Opportunities for Methane Recovery at U.S. Coal Mines, Revised 2009 states:

> "Life expectancy refers to the number of years left in the mine's plan for mining coal; it can be an important factor in determining whether a mine is a good candidate for a methane recovery and use project."

Prediction of mine life is difficult and speculative. With respect to resource quality and quantity, methane liberation and resulting concentrations from the Wadge coal seam are low, and any methane released is further diluted by mine ventilation air, with the result that the concentration of any methane discharge from mining operations (as a component of ventilation exhaust air) is so low that it renders collection and concentration of the resource for sale and use practically infeasible. Even if collection and concentration were feasible, a network of collection pipelines, compressors and storage tanks would be necessary to collect, store, and transport the methane.

Since there is no gas transmission pipeline in the immediate area, the gas would have to be trucked from a central temporary storage point to either a pipeline transfer point or gas processing plant. A market for the gas would also have to exist. Only high quality gas (>95% methane) can be used for pipeline injection, if a pipeline existed. The economic viability of capturing the gas is limited due to the investment necessary to obtain the rights to the gas by leasing, the quality of the gas, and the infrastructure required for distribution. Technologies for Ventilation Air Methane Capture are still in the

developmental stage and cost information is still limited (EPA CMOP, 2011). Therefore, the implementation of methane capture is unlikely, given past and current practice and technology.

Methane Flaring

The alternative to flare the methane was also considered and eliminated from detailed analysis. BLM determined it to be technically or economically infeasible and its implementation is remote and speculative. About 29 U.S. coal mining operations use vertical methane drainage wells to vent gas from the mines. In all cases, gas vented from these wells is discharged directly into the atmosphere. Under ideal conditions, operators would collect methane gas directly at the wellhead for sale or on-site use. Because of variable gas quality and quantity, difficulties in coordinating commercial gas recovery with underground mine degasification requirements, and the economics of commercializing methane mixed with air, coal mine operators commonly vent methane to the atmosphere and do not capture the gas.

In these cases, safety and environmental objectives could be satisfied by carefully flaring emitted gas. Gas flaring is a standard safety practice in some industries. For example, methane and other associated gases are routinely flared during processing and production of oil and gas, and are continuously flared from landfill collection systems. Incorporating a controlled flare system could minimize the potential of an unconfined conflagration occurring on the surface at the methane drainage discharge location(s) and would potentially reduce greenhouse gas effects through combustion of the associated hydrocarbons.

The Environmental Protection Agency is currently sponsoring research and outreach efforts to coal mine operators to encourage coalbed and coal mine methane capture or flaring (refer to www.epa.gov/coalbed). The methodology for flaring methane emissions from underground coal mines is emerging, but remains technologically speculative at this time. The hazard that flaring could create relative to the potential for an underground ignition has not been clearly dismissed by current technology. MSHA does not have regulations that would govern this activity, but has expressed concerns relative to safety with respect to the potential for propagation of fire through methane drainage boreholes into underground mines. MSHA would not approve flaring without significant preliminary testing to assure the safety of the miners; therefore flaring would not be practicable. There would also be an associated potential fire hazard where flammable brush, trees, or other vegetation exists in close proximity to the wellhead. The BLM does not have a policy governing flaring of gas from coal mining operations, so the issue of whether or not a gas lease would be required is unclear. These outstanding questions would have to be resolved if flaring is considered as an alternative to discharging methane into the atmosphere.

Additionally, flaring of methane would result in the release of other air pollutants, including nitrogen oxides, carbon dioxide, and carbon monoxide; these pollutants are regulated by the EPA for national ambient air quality standards. Methane is not a regulated gas. Therefore, the implementation of methane flaring is unlikely, given past and current practice and technology.

Competitive Bid by Another Company

The alternative for another company to successfully bid on this LBA was considered, but eliminated from detailed analysis. PSCM owns the surface of the 400 acres included in this LBA; therefore it is unlikely that another company would pursue bidding on this LBA. Moreover, the 400 acres would not provide a large enough area to economically develop and provide maximum economic recovery of the resource.

Chapter 3 – Affected Environment, Environmental Consequences, and Mitigation Measures

For the following resources and issues, those brought forward for analysis will be addressed below.

Resource/Issue	N/A or Not Present	Applicable or Present, No Impact	Applicable & Present and Brought Forward for Analysis
Air Resources			X
Areas of Critical Environmental Concern	X		
Environmental Justice			X
Cultural Resources			X
Flood Plains	X		
Fluid Minerals	X		
Forest Management	X		
Hydrology/Ground			X
Hydrology/Surface			X
Invasive/Non-Native Species		X	
Lands with Wilderness Characteristics	X		
Native American Religious Concerns			X
Migratory Birds			X
Paleontology		X	
Prime and Unique Farmland	X		
Range Management	X		
Realty Authorizations	X		
Recreation/Transportation	X		
Socioeconomics			X
Soils			X
Solid Minerals			X
T&E and Sensitive Animals			X
T&E and Sensitive Plants	X		
Upland Vegetation		X	
Visual Resources	X		
Wastes, Hazardous or Solid		X	
Water Quality - Surface			X
Wetlands/Riparian Zones		X	
Wild and Scenic Rivers	X		
Wild Horse & Burro Mgmt	X		
Wilderness Study Areas	X		
Wildlife – Aquatic	X		
Wildlife – Terrestrial			X

3.1 AIR RESOURCES

It is within the context of the above identified alternatives that the remainder of the section focuses on the following items:

- Affected Environment
- Regulatory Framework
- Direct and Indirect Emissions
- Air Quality Impact Analysis
- Mitigation

3.1.1 Affected Environment

Implementation of the Proposed Action Alternative would result in emissions of criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gases (GHGs). Fugitive particulate matter would be emitted when haul trucks and other vehicles associated with the mining activities travel on existing dirt roads or overland access routes to load-out locations. Emissions of particulate matter would be generated from processing equipment, material handling transfer points (including rail load-out locations), storage piles, and mine ventilation shafts. Air quality would also be impacted by fuel combustion sources, such as the engine exhaust emissions from locomotives, mobile material handling equipment, personnel transport equipment, and any stationary fuel combustion sources.

The facility is located in the central portion of Routt County, Colorado (Section 2, Township 5 North, Range 87 West of the 6th Principal Meridian), approximately 10 miles Southeast of Hayden, Colorado (population approx. 1600), and south of State Highway 40 between the towns of Steamboat Springs to the east and Craig to the west. Topography in the project area and adjacent lands ranges in elevation from approximately 6,600 feet to 7,800 feet. The average elevation of the project area is approximately 7,040 feet. Terrain varies from rolling hills with agricultural fields and rangeland in the northwestern, central, and extreme southern extents of the project area to high ridges and steep slopes within the eastern and southwestern portions of the project area. The normal temperatures (min and max) for the area range from 4.8 to 29.1 ˚F in January to 46.9 to 83.7 ˚F in July. The regional average annual precipitation amounts to approximately 19.01 inches, which according to historical records shows the lower elevations receiving relatively higher precipitation amounts in summer, while the higher elevations receive relatively higher amounts of precipitation in winter. Average annual wind resultants are generally from the east south east at speeds of approximately 3.6 to 8.8 mph for a majority of the time.

Air quality in the region is affected by multiple activities currently conducted within the area, which generally consists of smaller communities adjacent to the State Highway (SH) 40 corridor. Therefore, it is reasonable to conclude that indirect and cumulative effects on air quality in the area would be influenced in the near field by sources of emissions within 50km of the project site. Activities occurring within the area that affect air quality include stationary source facilities such as coal mines and subsequent coal mining operations (e.g., loading), concrete mix plants, gravel mines/pits, lime storage facilities, coal fired electrical generating plants, natural gas dehydration facilities, landfills, etc. Portable source examples include facilities such as gravel crushers, associated processing equipment, and asphalt plants. Mobile sources of emissions within the region would include highway or on-road vehicles, and

off-road vehicles such as construction related equipment (dozers, loaders, backhoes, etc…) and recreational vehicles (snowmobiles, ATVs, and dirt bikes). Smoke from grass and forest fires represent area source emissions that can impact air quality.

3.1.2 Regulatory Framework

The Clean Air Act (CAA), which was last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for criteria pollutants. Criteria pollutants are air contaminants that are commonly emitted from the majority of emissions sources and include carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 & 2.5 microns (PM_{10} & $PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2).
The CAA established 2 types of NAAQS:

Primary standards: – Primary standards set limits in order to protect public health, including the health of "sensitive" populations (such as asthmatics, children, and the elderly).

Secondary standards: – Secondary standards set limits in order to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

The EPA regularly reviews the NAAQS (every five years) to ensure that the latest science on health effects, risk assessment, and observable data such as incidence rates are evaluated in order to re-propose any NAAQS to a lower limit if the data supports the finding.
The Colorado Air Pollution Control Commission, by means of an approved State Implementation Plan (SIP) and/or delegation by EPA, can establish state ambient air quality standards for any criteria pollutant that is at least as stringent as, or more so, than the federal standards. Ambient air quality standards must not be exceeded in areas where the general public has access. Table 3.1 lists the federal and state ambient air quality standards.

Table 3-1, Ambient Air Quality Standards[1]

Pollutant [final rule cite]	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]	primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]	primary and secondary	Rolling 3 month average	0.15 µg/m^3 (2)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]	primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	primary and secondary	Annual	53 ppb (3)	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]	primary and secondary	8-hour	0.075 ppm (4)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years

Particle Pollution [71 FR 61144, Oct 17, 2006]	$PM_{2.5}$	primary and secondary	Annual	15 $\mu g/m^3$	annual mean, averaged over 3 years
			24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb (5)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary	Annual	0.03 ppm (6)	Arithmetic Average
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

(1) National Ambient Air Quality Standards (EPA, Oct. 2011) .
(2) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
(3) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
(4) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
(5) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved. (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard. (c) EPA is in the process of reconsidering these standards (set in March 2008).
(6) State of Colorado Primary Standard.
NOTE: Air quality in the Routt County Air Sheds currently meets all NAAQS & CAAQS.

3.1.2.1 Emissions, Source Classifications, & Regulatory Authority

Emissions sources are generally regulated according to their type and classification. Essentially all emissions sources fall into two broad categories, stationary and mobile.

Stationary sources are generally non-moving, fixed-site producers of pollution such as power plants, chemical plants, oil refineries, manufacturing facilities, and other industrial facilities. This source class can also cover certain types of portable sources. Stationary facilities emit air pollutants via process vents or stacks (point sources) or by fugitive releases (emissions that do not pass through a process vent or stack). Stationary sources are also classified as major and minor. A major source is one that emits, or has the potential to emit, a regulated air pollutant in quantities above a defined threshold. Stationary sources that are not major are considered minor or area sources. A stationary source that takes federally enforceable limits on production, consumptions rates, or emissions to avoid major source status are called synthetic minors. The Colorado Department of Health and Environment (CDPHE), Air Pollution Control Division (APCD) has authority under their approved SIP, or by EPA delegation, to regulate and issue Air Permits for stationary sources of pollution in Colorado.

Mobile sources include any air pollution that is emitted by motor vehicles, engines, and equipment that can be moved from one location to another (typically under their own power). Due to the large number of sources, which includes cars, trucks, buses, locomotives, construction equipment, lawn and garden equipment, aircraft, watercraft, motorcycles, etc…, and their ability to move from one location to another, mobile sources are regulated differently than stationary sources. In general, EPA and other

federal entities retain authority to set emissions standards for these sources depending on their type (on-road or off-road) and class (light duty, heavy duty, horse power rating, weight, fuel types, etc…). Mobile sources are not regulated by the state (an exception being California) unless they are covered under an applicable SIP specific to a non-attainment or maintenance area.

3.1.2.2 Criteria Pollutants

All the criteria pollutants shown in table 3-1 above are directly emitted, with the exception of ground level ozone and any formation of secondary $PM_{2.5}$ (also known as condensable particulate matter). Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NO_X and VOCs are Ozone precursors). Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NO_X emissions from various sources within a region, and has the potential to be transported across long ranges. Therefore, it is typically not appropriate to assess potential ozone impacts of a single project on potential regional ozone formation and transport. However, the State assesses potential ozone impacts from its authorizing activities on a regional basis when an adequate amount of data is available and where such analysis has been deemed appropriate. For this reason (inappropriate scale of analysis), ozone will not be further addressed in this document beyond the related precursor discussions, and an appropriate qualitative analysis. Condensable particulate matter, or secondary $PM_{2.5}$ particles, are primarily ammonium sulfate and nitrate formed in the atmosphere from gaseous emissions of sulfur dioxide (SO_2) and oxides of nitrogen (NO_X), reacting with ammonia (NH_3). According to the EPA, the chemical composition of $PM_{2.5}$ is characterized in terms of five major components that comprise the mass of pollutant. Primary emissions of $PM_{2.5}$, (i.e. directly emitted) are generally from combustion processes (fossil fuels and biomass) where these sources contribute to the Elemental Carbon (EC, also known as black carbon) and Organic Carbon (OC) components of the particles overall composition. In the west, OC is generally the largest estimated component of $PM_{2.5}$ by mass. A minority component of primary $PM_{2.5}$ is made up of crustal elements (i.e. fugitive dust, generally 5-15%). For the purposes of this EA, secondary $PM_{2.5}$ will not be addressed in more detail than a general discussion of particulates due to the inappropriateness of scale for any such analysis.

3.1.2.3 Hazardous Air Pollutants

Toxic air pollutants, also known as hazardous air pollutants (HAPs), are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The majority of HAPs originate from stationary sources (factories, refineries, power plants) and mobile sources (e.g., cars, trucks, buses), as well as indoor sources (building materials and cleaning solvents). No ambient air quality standards exist for HAPs; instead emissions of these pollutants are regulated by a variety of laws that target the specific source category and industrial sectors for stationary, mobile, and product use/formulations. The majority of HAPs emitted from the Sage Creek mine's operations are the result of the on-road and non-road vehicle use. The largest component of the HAPs emissions from these sources are typically various benzene compounds, and the majority of them are emitted from spark ignition (gasoline fueled) combustion sources, simply due to the fact that benzene is present in larger % volumes in the fuel (typically 1.0% vs. 0.05% for diesel fuel).

3.1.2.4 Green House Gases

Gases that trap heat in the atmosphere are often called greenhouse gases, and include carbon dioxide (CO_2), methane (CH4), Nitrous Oxide (N2O), and several fluorinated species of gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Carbon dioxide is emitted from the combustion of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Methane is emitted during the production and transport of coal, natural gas, and oil. Methane also results from livestock and other

agricultural practices and by the decay of organic waste in municipal solid waste landfills. Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Fluorinated gases are powerful greenhouse gases that are emitted from a variety of industrial processes and are often used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons).

These gases all have various capacities to trap heat in the atmosphere, which are known as global warming potentials (GWPs). Carbon dioxide has a GWP of 1, and so for the purposes of analysis a GHGs GWP is generally standardized to a carbon dioxide equivalent (CO_2e), or the equivalent amount of CO_2 mass the GHG would represent.

As with the HAPs, ambient air quality standards do not exist for GHGs. In its Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, the EPA determined that GHGs are air pollutants subject to regulation under the CAA. The most recent rules promulgated to regulate the emissions and the industries responsible are the Mandatory Reporting Rule (74 FR 56260) and the Tailoring Rule (70 FR 31514). Under the EPA GHG Mandatory Reporting Rule, Underground Coal Mines subject to the rule are required to report emissions in accordance with the requirements of Subpart FF. Under the provisions of the Tailoring Rule (step 2 – July 2011) a facility would be subject to PSD permitting if it has the potential to emit GHGs in excess of 100,000 tpy of CO_2e equivalent and 100/250 tpy of GHGs on a mass basis. For existing facilities, this review would take place during any subsequent modifications to the facility that would trigger a permit review (CDPHE's anticipated implementation strategy).

The EPA is also planning to develop stationary source GHG emissions reduction rules (New Source Performance Standards) that could mandate substantial reductions in U.S. greenhouse gas emissions. Alternatively, Congress may develop cap-and-trade legislation as another means to reduce GHG emissions. Consequently, GHG emissions from coal combusted to generate electricity are likely to be increasingly regulated in the near future. The first EPA regulation to limit emissions of GHGs imposed carbon dioxide emission standards on light-duty vehicles, including passenger cars and light trucks (GPO 2010e). As of February 2011, the EPA had not set GHG emission standards for stationary sources (such as compressor stations); however, the EPA is gathering detailed GHG emission data from thousands of facilities throughout the U.S., and will use the data in order to develop an improved national GHG inventory, as well as to establish future GHG emission control regulations.

3.1.2.5 Air Quality and Prevention of Significant Deterioration (PSD)

Air quality for any given area (any geographical area that defines the class boundary) is designated as either attainment, or nonattainment. Attainment areas are those areas where criteria pollutant concentrations in ambient air do not exceed the NAAQS levels as outline above. Areas or regions where criteria pollutant concentrations in ambient air exceed the NAAQS levels are designated as nonattainment for the NAAQS. Two additional subset categories of attainment exist for those areas where formal designations have not been made, i.e. Attainment/Unclassifiable (generally rural, or natural areas), and for areas where previous violations of the NAAQS have been documented, but pollution concentrations no longer exceed NAAQS concentrations, i.e. Attainment/Maintenance areas. Routt County is designated as an attainment area for NAAQS pollutants.

All geographical regions are assigned a priority Class (I, II, or III) which describes how much degradation to the existing air quality is allowed to occur within the area under the Prevention of significant Deterioration (PSD) regulations. Class I areas are areas of special national or regional natural, scenic, recreational, or historic value, and essentially allow very little degradation in air quality, while Class II areas allow for reasonable industrial/economic expansion. There are currently no Class III areas defined in Colorado. The closest PSD Class I areas (which require the most stringent protection for air quality) are Mount Zirkel and the Flat Tops Wilderness Area, located 25 miles to the Northeast and 20 miles South of the proposed LBA area, respectively.

For an area that is in attainment for the NAAQS and CAAQS, the CAA provides specific criteria for stationary sources to allow for economic growth under the PSD regulations (40 CFR 52.21 or 40 CFR 51.166 for SIP approved Rules). Major PSD sources (or major modifications to existing PSD sources) are required to provide an analysis to ensure their net emissions will not cause or contribute to a violation of any applicable NAAQS or PSD increment. In addition, the analysis required for permitting must include impacts to surface waters, soils, vegetation, and visibility (also known as air quality related values (AQRVs)) caused by increases in emissions, and from any associated growth (or growth in industrial, commercial, and residential sectors that will occur in the area as a direct result of the source). Where a PSD source is located near a Class I airshed (within 50km) the AQRVs thresholds set by the applicable Class I controlling agency (Federal Land Manager) must be assessed to determine if an adverse impact on the area is likely to occur. The Sage Creek Mine is not a major PSD source and BLM is not the regulatory authority authorizing emissions and enforcing applicable permit conditions for the mine's operations. As such, the BLM will not be providing any additional analysis for any potential Class I area impacts.

3.1.3 Emissions Inventory

The proposed action alternative will produce direct and indirect emissions of the above identified pollutants. As stated in the proposed alternative action, and no action alternative, emissions rates or intensities would not increase under either alternative and therefore the emissions inventory can reasonably be expected to be the same for each alternative based on the fact that production rates would not increase under either scenario.

3.1.3.1 Direct Emissions

With the exception of particulate matter (TSP & PM_{10}) all of the directly emitted criteria pollutants originating for the mine's operations are from fuel combustion sources, such as mobile mining equipment, haul trucks, and stationary sources (emergency generators, light poles, heaters, etc…). HAPs and GHGs are also emitted from fuel combustion sources, albeit in de minimis amounts. Coal Mine Methane (CMM) will also be emitted by the ventilation air handling system required by MSHA to reduce the combustion/explosion potential of the mine's underground atmosphere (also known as Ventilation Air Methane or VAM). Peabody Energy does not drill gob vent boreholes (GVB) for its adjacent longwall mine (Foidel Creek) to vent methane due to the area's naturally low occurring presence of the gas in the coal formation, overburden, and surrounding strata, and therefore the company does not plan, project, or possess MSHA permits requiring GVB drilling at the Sage Creek mine. VAM will be the only source of CMM emissions at the Sage Creek Mine. Methane emissions from this activity would require reporting to EPA under the previously mentioned Mandatory Reporting Rules if reporting thresholds are exceeded.

Stationary sources (including any area and fugitive emissions) at the Sage Creek mine are regulated by CDPHE where applicable and are authorized by APCD permit number 10RO1175F. Additionally sources regulated by APCD permit 93RO1204 for the Foidel Creek coal mine are included because all of the coal extracted from the Sage Creek mine will be transported, processed, and loaded out from the Foidel Creek surface facilities. Therefore, those emissions sources are included for completeness and disclosure purposes. The permits provide limitations and requirements to limit potential emissions from the site to below major source thresholds for certain criteria pollutants. When pollutants are not explicitly addressed in the permit it is due to the fact that they are below the state's permitting or air pollution emissions notice (APEN) thresholds. Therefore, the Sage Creek Mine is classified as a minor source for all pollutants and is not subject to the PSD rule requirements for permitting at this time. Peabody does not anticipate modifying either permit to accommodate production due to the fact that Sage Creek mine will be ramping up production to replace declining production at the Twentymile mine. Several pieces of stationary equipment at the Foidel Creek site are covered by New Source Performance

Standard (NSPS) subpart Y, which specifies emissions standards for coal preparation plants (see permit 93RO1204, condition 10). Under the SIP PSD rules, the site is covered under one of the 28 named source categories (AQCR 3, Part D, Section II.A.24.e) which requires inclusion of any fugitive emissions related to the coal process operations in the site's potential to emit calculations for major source determination. Stationary sources of direct emissions at the Sage Creek and Foidel Creek mines include the following:

- Material Handling Conveyors
- Mine Ventilation Shafts
- Internal Combustion Engines
- Fuel Storage Tanks
- Material Processing Screens (93RO1204)
- Material Processing Crushers (93RO1204)
- Surface Operations (fugitive PM)
- Misc. Facility Heating Equipment

HAP emissions from stationary sources are considered de minimis. For the purposes of disclosing impacts from the alternatives proposed, insufficient data and analysis exists to determine if any portion of the ventilation air emissions would be considered a hazardous air pollutant. Of the sources identified above, only the fuel tanks, internal combustion engines, and miscellaneous heating equipment would generate HAP emissions. Because of the limited use or the exempt status of the identified units, expected cumulative HAP emissions from these sources would be on the order of pounds per year, and therefore will not be analyzed any further in this document.

Mobile sources at the facility include underground mining equipment, listed under source classification code (SCC) 2270009010, aboveground construction equipment identified under SCC 2270002000, as well as light duty gasoline trucks and light and heavy duty diesel trucks. The underground mining mobile sources are specialized, industry specific equipment designed to function in the unique environment of an underground mine, while the aboveground sources would be heavy construction equipment used for material handling and stockpile management.

With respect to generating an emissions inventory for the mobile sources at the site, BLM staff utilized the data submitted to CDPHE as part of the air dispersion modeling report to support the mine's air permit application. Detailed information was provided for the surface operations and equipment such that no further analysis was required for these sources and the data was incorporated directly.

To provide acceptable emissions estimates and to fully disclose expected direct emissions from the facility's expected underground mobile sources, BLM staff utilized EPA's Nonroad model (2008a) to generate SCC specific emissions factors (grams per horsepower-hour) for Routt County based equipment inventories (underground mining) for the year 2005. The year 2005 inventory was chosen to match the inventory that was provided for the surface sources from the modeling report sent to APCD. To estimate emissions from the sources, BLM staff had to determine a reasonable thermal efficiency (TE) for the underground equipment in order to estimate the total horsepower-hours the mine's annual fuel use would provide to the equipment. This was necessary because the emissions factors derived from the Nonroad model already account for the overall TE of the equipment, as well as some of the other variables, such as deterioration factors, loading factors, etc. The CO_2 emission factor was used to estimate the TE because the model does not rely on a particular control technology, engine class, or equipment type for its derivation. Instead the model calculates the CO_2 emissions rates based on the in-use brake specific fuel consumption (BSFC - reported as pounds of fuel per horsepower-hour), which is essentially static across all horsepower classes for all model years.

Peabody Energy also uses light duty gasoline and diesel trucks (LDGT & LDDT) to ferry personnel between the Foidel Creek and Sage Creek mines and to conduct daily business. Peabody provided the annual fuel use (diesel and gasoline) for the Foidel Creek mine operations, but BLM staff could not delineate the minor amount of diesel that would be consumed by the LDDT from the Heavy equipment use since no information was available to describe the LDDT fleet characteristics or annual vehicle miles travelled, no emissions estimates are provided. For the LDGT, production proration was used to estimate fuel use for these sources at the Sage Creek mine. To estimate emissions from haul truck data BLM staff made use of Routt County special use permit data and EPA National Clean Diesel Campaign (NCDC) Quantification Calculator (based on EPA MOVES emissions factors). The calculator provided emissions for several pollutants based on a typical MY2000 Class 7 vehicle, averaging a very conservative 2.057 miles per gallon and travelling 605,714 round trip miles per year.

Table 3-2 Direct Criteria and GHG Emissions from Stationary and Mobile Sources (2011)

Stationary Sources	AIRS ID	PM (TSP)	PM_{10}	$PM_{2.5}$	NMOG	CO	NO_X	SO_2	CO_2	CH_4	N_2O
Aggregates / Mine Vents / Fugitives (10RO1175F)	01 - 04	328.45	86.30	9.48	NA	NA	NA	NA	NA	NA	NA
Fuel Storage Tanks (XA)	NA	NA	NA	NA	3.99[1]	NA	NA	NA	NA	NA	NA
Aggregates Processing (93RO1204)[2]	101-198	76.36	24.11	4.94	NA	NA	NA	NA	NA	NA	NA
Emergency Generator (TBD)	NA	0.01	0.01	0.01	0.01	0.14	0.13	0.00	19.43	0.00	ND
Methane Sources (VAM)	NA	NA	NA	NA	NA	NA	NA	NA	ND	298[3]	NA
Mics. Heating Equipment[4]	NA	0.23	0.07	0.17	0.27	2.50	4.33	0.17	4,158.87	0.07	0.03
Fugitives[5]	NA	5.84	1.11	0.28	NA	NA	NA	NA	NA	NA	NA
Mobile Sources[6]	**SCC**	**PM (TSP)**	**PM_{10}**	**$PM_{2.5}$**	**NMOG**	**CO**	**NO_X**	**SO_2**	**CO_2**	**CH_4**	**N_2O**
Underground Mining Equipment	2270009000	3.08	3.08	2.99	5.02	20.44	22.75	0.02	1,709.42	0.08	0.04
Surface Mining Equipment	NA	ND	7.5	7.5	ND	65.2	147.8	0.1	14,587	ND	ND
Haul Trucks & LDGT	HDDT (Class 7) & LDGT	0.012	0.012	0.339	0.752	3.649	7.187	0.009	3,308.37	ND	ND

Total Direct Emissions (tons)	**413.98**	**122.19**	**25.71**	**10.04**	**91.93**	**182.20**	**0.30**	**23,783.09**	**298.15**	**0.07**

[1] Emissions based on APEN exemption (XA) threshold in attainment area (< 2.0 tpy) x 2 tanks.

[2] Emissions estimates derived by dividing annual allowable emissions at Foidel Creek mine by annual production limitation and multiplying by Sage Creek annual production limitation.

[3] The CO_2e of the methane gas is approximately 6,262 tons (estimates based on Foidel Creek mine measurements (made in accordance with 40 CFR 98.323) and scaled to production limits at Sage Creek. Estimates assumed to be similar based on the general proximity of the mine and the areas known geologic conditions.

[4] Emissions estimates made form Foidel Creek annual propane use divided by annual air flow at the mine and then multiplying by the Sage Creek annual air flow.

[5] Fugitives include on-road particulate emissions estimated for daily haul traffic to Foidel Creek Mine (trips based on Routt County special use permits (PP2010-017 & PP2010-018).

[6] Mobile sources emissions are for exhaust only, road dust emissions from these sources are included in permitted or fugitives above.

3.1.3.2 Indirect Emissions

Electrical energy consumed at the site can reasonably be expected to produce emissions from the supplying source, unless that source is some form of renewable energy. It is possible to provide rough estimates of emissions resulting from mine electricity consumption if the annual energy consumption data is known. Reasonable emissions estimates can be made for some pollutants (NO_X, SO_2, CO_2, N_2O, & CH_4) by making use of EPA's Emissions & Generation Resource Integrated Database (eGRID). The eGRID tool is a comprehensive inventory of environmental attributes of electric power systems and is based on available plant-specific data for all U.S. electricity generating plants that provide power to the electric grid and report data to the U.S. government, including the following agencies: EPA, the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission (FERC). Emissions data collected by EPA is integrated with generation data from EIA to produce useful values like pounds of emissions per megawatt-hour (lb/MWh), which allows direct comparison of the environmental attributes of electricity generation by state, U.S. total, company, and by three different sets of electric grid boundaries. Table 3-3 provides an estimate of indirect emissions for the mine's electrical consumption data, however the data does not account for transmission and distribution losses inherent and specific to the component composition of any regional grid. The most recent data available online (2005) suggests Colorado imports only 1-3% of its total electricity demand on an annual basis. For the practical purposes of this EA, BLM considers Colorado to be neither a net energy exporter, nor importer, and therefore all indirect emissions estimates from mine electricity consumption are based on Colorado source data.

Locomotive emissions from hauling the mined and processed coal are currently occurring in the proposed action area and would continue under the Proposed Action Alternative. It is estimated that 70% of all railroad traffic in the U.S. is dedicated to the transport of coal. Although this statistic may be appropriately applied to certain metropolitan statistical areas, it may not reflect actual rail traffic composition for Routt County. BLM could not locate any data to suggest otherwise, but to be conservative in our analysis an assumption was made that all rail emissions are from coal hauling, and further, that all rail emissions are attributed to the Foidel Creek mine's operations (although the Trapper Mine in Craig, Colorado, is also likely responsible for some of the Routt Co. coal hauling rail traffic). To account for the project level emissions resulting from this action, BLM staff divided 100% of the County level emissions by the total production at the Twentymile Coal mine for the same data year (2008, the Sage Creek mine did not exist and was not producing and was therefore excluded) and then multiplied by the annual allowable production for the Sage Creek mine alone. The result is an extremely conservative estimate of what could be considered present emissions. It is highly likely that emissions from this source class have been decreasing, and will continue to do so in the future, due to the implementation of new emissions standards for new and reconstructed locomotives (2000 and 2008). EPA estimates that the average useful life for these engines is 750k miles or 10 years, whichever occurs first, meaning that on average an engine is replaced or reconstructed every ten years and will have to comply with the most stringent emissions requirement applicable to the engine at that time.

Combustion of the mined and processed coal will produce all of the emissions outlined in section 2. According to U.S. EPA figures contained in the Draft US GHG Inventory Report (2012), nearly 95% of all coal consumed in the U.S. during 2010 was used in the generation of electric power. Because of this, it can reasonably be assumed that the coal from the Sage Creek mine will be shipped to a coal-fired power plant. It would be possible to provide an estimate of Criteria, HAP, and GHG emissions associated with the burning of the mined coal at a specific facility; however, the types and location of the facilities the coal might be processed and consumed in is speculative and not foreseeable. The contractual agreements between the coal fired power plant and the coal supply company are outside the scope of this analysis, and the BLM does not determine at which facilities the coal would be consumed. Additionally, different emissions control devices, firing practices, and the age/overall efficiency of any

specific power plant could greatly affect the amount of Criteria, HAP and GHG emissions that are released into the atmosphere. For example, a power plant that is equipped with selective catalytic reduction or practices CO_2 capture would ultimately release much smaller quantities of NO_X and CO_2 than a power plant lacking such controls.

Even though the BLM cannot reasonably say where all of the coal produced by the mine will be consumed, it is still possible to do emissions calculations to estimate certain criteria and GHG emissions from the combustion of the coal. Just as the mine's electrical consumption data can be utilized in concert with the eGRID data to produce emissions estimates, the same can be done for coal combustion for any production volume if the energy content of the coal is known or can be reasonably estimated. To produce these estimates BLM staff used eGRID data for state, regional, and national levels to produce a worst case scenario from the emissions profiles. The three scenarios were produced based on the fact that BLM cannot reasonably predict where the coal might be consumed. The current online eGRID data is several years old now, and it is expected that newer emissions rules such as Best Available Retrofit Technology (BART) and any associated retrofits will lower the overall coal fired power plant emissions over time, and therefore the estimates provided in table 3-3 below are considered conservative.

Table 3-3 Indirect Criteria and GHG Emissions (tons/year)

Source[1,4]	PM (TSP)	PM_{10}	$PM_{2.5}$	NMOG	CO	NO_X	SO_2	CO_2	CH_4	N_2O
Electricity[2] Consumption	ND	ND	ND	ND	ND	43.64	37.84	28,531	0.35	0.44
Rail Hauling[3]	ND	1.35	1.35	2.03	5.38	54.6	3.11	ND	ND	ND
Coal Combustion (State -CO)	ND	ND	ND	ND	ND	8,703	7,762	5,197,875	ND	ND
Coal Combustion (Regional – RMPA)	ND	ND	ND	ND	ND	7,253	5,985	4,855,780	ND	ND
Coal Combustion (National)	ND	ND	ND	ND	ND	6,735	18,289	4,622,729	ND	ND
Total Indirect Emissions (tons)[5]	**ND**	**1.35**	**5.38**	**2.03**	**5.38**	**8,801**	**18,330**	**5,226,406**	**0.35**	**0.44**

[1] ND = No Data

[2] Electricity consumptions estimates made from 2008 eGrid data for producers within Colorado.

[3] $PM_{2.5}$ emissions assumed to be the same as PM_{10} data. Emissions derived from 2008 Routt County Data, assumes all rail capacity dedicated to Sage Creek and Foidel Creek coal hauling.

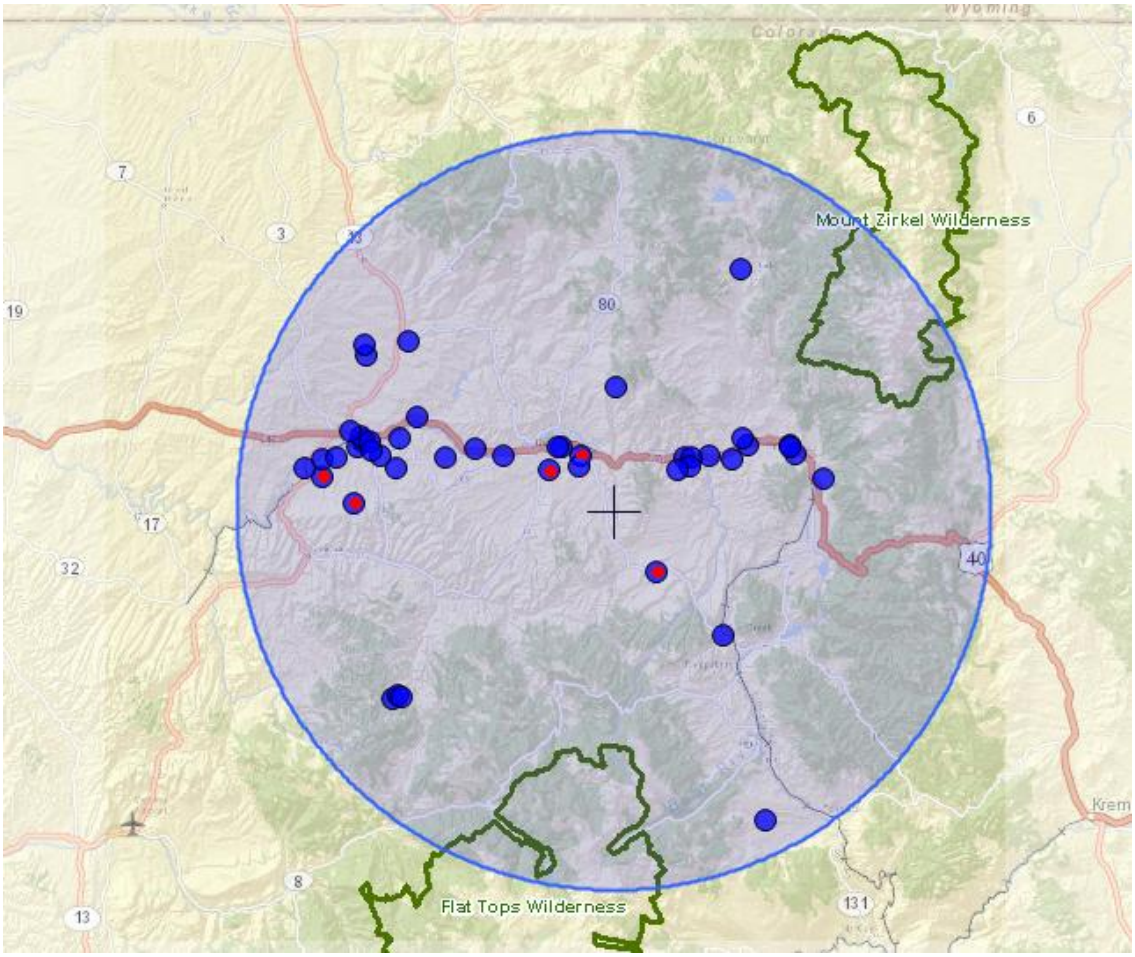
[4] Coal combustion emissions estimates made from 2008 eGRID data for Input Emissions Rates and sampled Btu data for Sage Creek coal.

[5] Total Indirect Emissions include the worst case (highest emissions) scenario for coal combustion out of the 3 presented.

3.1.3.3 Area Emissions

The following emissions data is provided to the reader to provide a comprehensive picture of area emissions (including Routt County) and to frame the analysis sections to follow.

Figure 2 APCD PM_{10} Sources (50km buffer)[1]

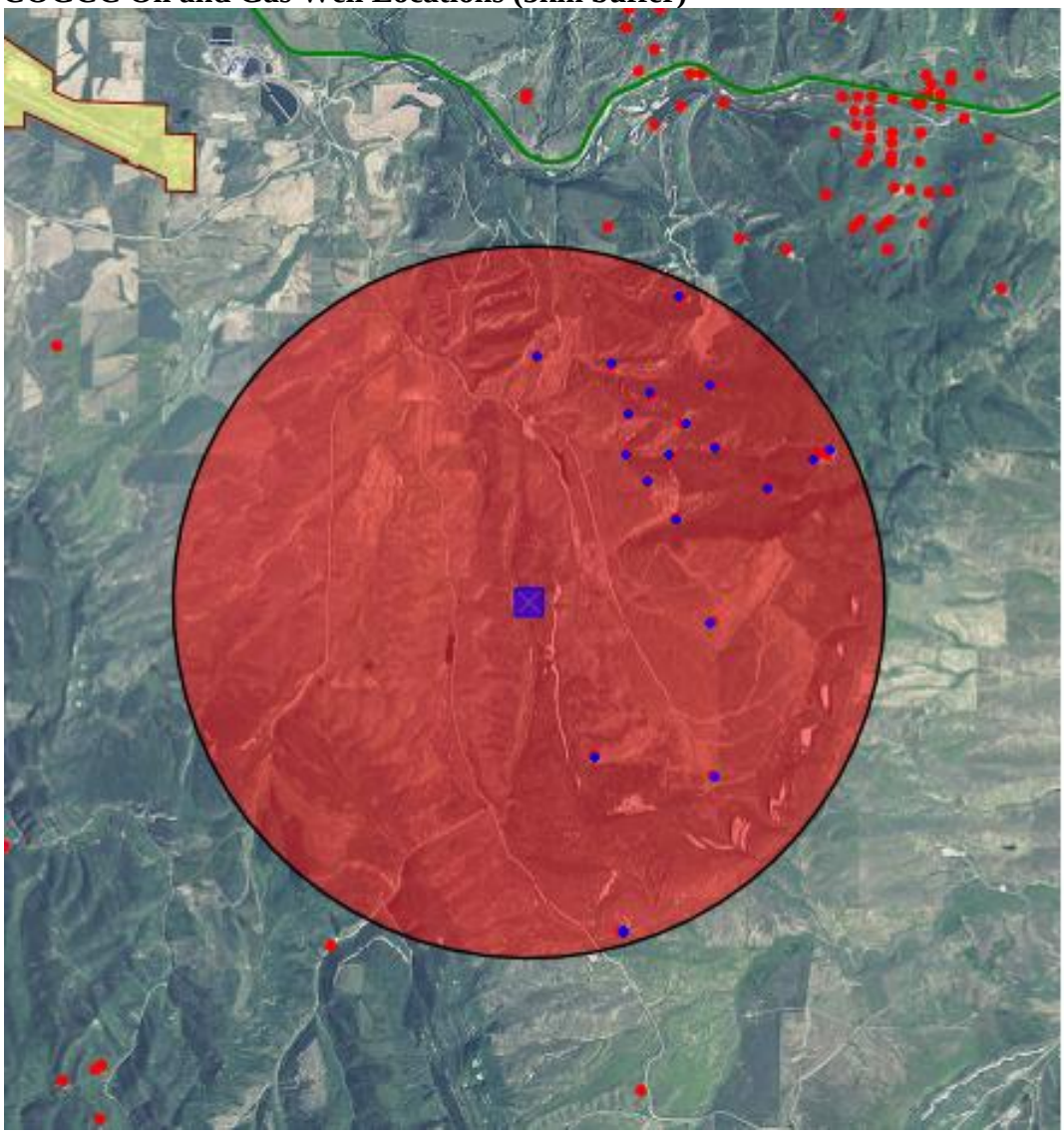


[1] 50km Buffer Map of PM10 sources generated from the following APCD website: http://www.colorado.gov/airquality/ss_map_wm.aspx, Sage Creek Mine located at crosshair in the center of the buffer area.
Note: Blue dots indicate all permitted or APEN sources in APCD Database, red highlights are for sources emitting PM10 > 50 tpy

Table 3-4 APCD Highlighted Sources of PM_{10}

Distance (km)	AIRS ID	Facility Name	PM_{10} (tpy)
38.8	081-0018	TRI STATE GENERATION CRAIG	206.23
8.7	107-0001	PUBLIC SERVICE CO HAYDEN PLT	159.35
10.3	107-0013	HAYDEN GULCH TERMINAL INC	71.02
34.3	081-0005	TRAPPER MINING INC	852.40
9.7	107-0009	TWENTYMILE COAL CO.- FOIDEL CREEK	174.37
Total Actual APEN Reported PM_{10} Emissions (within 50 km buffer, all sources):			**1,666.21**

Figure 3 COGCC Oil and Gas Well Locations (5km buffer)[1]



[1] 5km Buffer Map of Well Locations generated from the following Colorado Oil and Gas Conservation Commission (COGCC) website: http://dnrwebcomapg.state.co.us/mg2010app/, Sage Creek Mine located at blue "X" in the center of the buffer area.

Table 3-5 COGCC Producing Oil and Gas Wells (5 km buffer)

Well Description	Operator	Formation	Status
05-107-06051, TOW CREEK 13-11	OMIMEX PETROLEUM INC	NBRR	PR
05-107-06047, GRASSY CREEK COAL CO 1	LYSTER OIL COMPANY INC	NBRR	PR
05-107-06034, GRASSY CREEK COAL CO 2	HRM RESOURCES LLC	NBRR	PR
05-107-06078, GRASSY CREEK COAL CO 3	HRM RESOURCES LLC	NBRR	PR
05-107-05229, GRASSY CREEK COAL CO 1	BOOCO'S CONTRACT SERVICES INC	NBRR	PR

Note: All other wells within buffer area are abandoned, with one well listed as shut in. According to COGCC data, Routt County has a total of 29 producing (i.e. active) wells.

Table 3-6 Routt County Emissions Inventory (CDPHE 2008)

Source Type	Inventory Pollutants					
	CO	NO_2	SO_2	PM_{10}	VOC	BEN
Vehicles:	4,801.54	795.1	6.83508	37.29	405.073	12.7883
Road Dust:	ND	ND	ND	1,876.61	ND	ND
Non-Road:	1,777.44	342.709	1.06891	38.5814	349.203	9.24349
Wood burning:	708.565	9.63943	1.50392	98.3719	135.352	5.83912
Point Source:	423.997	7,031.23	2,549.74	691.475	69.1383	0.1668
Railroad:	21.5165	218.401	12.4407	5.41957	8.12936	0.01927
Aircraft:	218.286	15.4969	1.75634	3.97697	18.0401	0.40355
Forest/Ag. Fires:	433.341	11.4423	3.66152	59.9574	27.9191	2.09931
Solvents:	ND	ND	ND	ND	86.5139	ND
Agricultural Tilling:	ND	ND	ND	792.33	ND	ND
Structure Fires:	1.38218	0.03291	0.01605	0.2523	0.2523	ND
Surface Coating:	ND	ND	ND	ND	70.3516	ND
Restaurants:	2.18466	0.01729	ND	5.89048	5.44678	0.09602
Biogenic:	2,283.42	255.144	ND	ND	25,055.1	ND
Oil Gas Point:	13.61	14.65	0.0021	0.03505	59.4445	0.14892
Oil Gas Area:	9.5057	5.26723	0.15961	0.31923	14.8141	ND
Combustion:	81.9824	32.9741	5.1415	1.76532	4.11262	0.00095
Tank Trucks:	ND	ND	ND	ND	0.36824	0
Refueling:	ND	ND	ND	ND	14.5943	0.14943
Portables:	ND	ND	ND	ND	17.874	0.05754
Construction:	ND	ND	ND	1,243.95	ND	ND
Pesticides:	ND	ND	ND	ND	20.4522	ND
Totals (tons):	**10,776.77**	**8,732.10**	**2,582.33**	**4,856.23**	**26,362.18**	**31.01**

ND = No Data

Note: All data extracted from the following CDPHE website: http://www.colorado.gov/airquality/inv_maps_2008.aspx

3.1.4 Air Quality Impacts

The region surrounding the proposed action alternative area (APCD-Mountain Counties) is currently designated as in attainment for all criteria pollutants. The attainment status for pollutants in the project area is determined by monitoring levels of criteria pollutants for which National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS) apply. The attainment designation means that no violations of any ambient air quality standard have been documented in the area. The area around the proposed alternative action area is also identified as Class II, which allows for reasonable economic growth. The Proposed Action analyzed in this EA does not address any increase in production above currently authorized levels, and would not constitute adding additional production to previously authorized limits. Further, the action does not represent an increase in mining intensity within the region due to the fact that as the Sage Creek Mine ramps up production, the Foidel Creek Mine (also owned by Peabody Energy) will be ceasing extraction operations, which should result in stable production yields across the contemporaneous timeframes.

3.1.5 Air Monitoring

The Mountain Counties are generally those located on or near the Continental Divide. They consist of mostly small towns located in tight mountain valleys. The primary monitoring concern is particulate pollution from wood burning and road sanding. Area communities range from Steamboat Springs in the north to Breckenridge near the I-70 corridor, as well as Aspen, Crested Butte and Mt. Crested Butte in the central mountains and Pagosa Springs in the south. Currently, there are six particulate (PM_{10}) and one gaseous (O_3) monitoring sites operated by the APCD in the Mountain Counties region.

Grand Junction (APCD-Western Counties) is the only large city in the area, and the only location that monitors for CO and air toxics on the western slope. In 2008, Rifle, Palisade, and Cortez began monitoring for ozone. The other Western County locations monitor only for particulates. They are located in Delta, Durango, Parachute, and Telluride. Currently, there are four gaseous pollutant monitors and 11 particulate monitors in the Western Counties area. There are one CO, three O_3, eight PM_{10}, and three $PM_{2.5}$ monitoring sites.

PM_{10} data have been collected in Colorado since 1985, however the samplers were modified in 1987 to conform to the requirements of the new standard. Therefore available trend data is only valid back to 1987. Since 1988, the state has had at least one monitor exceed the level of the 24-hour PM_{10} standard (150 µg/m) every year except 2004. Monitoring for $PM_{2.5}$ in Colorado began with the establishment of sites in Denver, Grand Junction, Steamboat Springs, Colorado Springs, Greeley, Fort Collins, Platteville, Boulder, Longmont, and Elbert County in 1999. Additional sites were established nearly every month until full implementation of the base network was achieved in July of 1999. In 2004, there were 20 $PM_{2.5}$ monitoring sites in Colorado. Thirteen of the 20 sites were selected based on the population of the metropolitan statistical areas. This is a federal selection criterion that was developed to protect the public health in the highest population centers. In addition, there were seven special-purpose monitoring (SPM) sites. These sites were selected due to historically elevated concentrations of PM_{10} or because citizens or local governments had concerns of possible high $PM_{2.5}$ concentrations in their communities. All SPM sites were removed as of December 31, 2006 due to the low concentrations of $PM_{2.5}$ measured and a lack of funding.

Because the Sage Creek Mine is primarily a source of PM_{10} emissions, only the recent monitoring data for particulate matter is shown below. The regional monitoring data for ozone, $PM_{2.5}$, and

carbon monoxide suggests the air quality at the monitored locations is easily attaining the national standards, and therefore was not included in the values table below. More so than other pollutants, PM_{10} is a localized pollutant where concentrations vary considerably. Thus, local averages and maximum concentrations of PM_{10} are more meaningful than averages covering large regions or the entire state. The data below is presented for qualitative purposes only.

Table 3-7 Mountain & Western County Gaseous, Particulate, and Meteorological Monitors in Operation for 2010[1]

County	Location	CO	SO_2	NO_x	O_3	PM_{10}	$PM_{2.5}$	Met
Archuleta	Pagosa Springs - School 309 Lewis St.					X1		
Gunnison	Crested Butte - 603 6th St.					X6		
	Mt. Crested Butte 19 Emmons Rd.					X1		
Pitkin	Aspen - Library 120 Mill St.					X3		
	Aspen - Pump House				X			
Routt	Steamboat Springs - 136 6th St.					X1		
Summit	Breckenridge - 501 N. Park Ave.					X1		
Delta	Delta - Health Dept 560 Dodge St.					X3		
Garfield	Rifle - Health Dept 195 W. 14th Ave.				X			
	Rifle - Henry Building 144 E. 3					X3 / H	H	
	Parachute - Elem. School 100 E. 2					X3		
La Plata	Durango - River City Hall 1235 Camino del Rio					X3		
Mesa	Grand Junction - Pitkin 645¼ Pitkin Ave.	X				H		X
	Grand Junction - Powell 650 South Ave.					X3	X3 / H	
	Palisade Water Treatment 865 Rapid Creek Rd.				X			X
	Clifton - Hwy. 141 & D Rd.					X3		
Montezuma	Cortez - Health Dept 106 W. North Ave.				X		X6	
San	Telluride - 333 W. Colorado					X3		

Miguel	Ave.							

(Xn) – Filter Sample Continued; n=frequency in days, (H) – Hourly particulate
[1] Source: Colorado Air Quality Data Report 2010, available at http://www.colorado.gov/airquality/tech.aspx

Table 3-8 Mountain & Western County 2010 Monitored PM Values[1]

County	Location	PM_{10}			$PM_{2.5}$	
		Annual [2]	24 Hour (Max)	3 Yr. Ave. Ex.	Annual	24 Hour
Archuleta	Pagosa Springs - School 309 Lewis St.	24.5	349	3		
Gunnison	Crested Butte - 603 6th St.	25.1	174	3		
	Mt. Crested Butte 19 Emmons Rd.	16.1	168	1		
Pitkin	Aspen - Library 120 Mill St.	15.6	70	0		
Routt	Steamboat Springs - 136 6th St.	21.7	99	0		
Summit	Breckenridge - 501 N. Park Ave.	14.6	80	0		
Delta	Delta - Health Dept 560 Dodge St.	23.4	125	0		
Garfield	Rifle - Henry Building 144 E. 3	25.5	59	0	< 3 yrs Data	< 3 yrs Data
	Parachute - Elem. School 100 E. 2	22.5	125	0		
La Plata	Durango - River City Hall 1235 Camino del Rio	24.8	320	6.1		
Mesa	Grand Junction - Pitkin 645¼ Pitkin Ave.	26.8	171	1		
	Grand Junction - Powell 650 South Ave.	22.9	155	0	9.3	34.5
	Clifton - Hwy. 141 & D Rd.	23	189	3		
Montezuma	Cortez - Health Dept 106 W. North Ave.				< 3 yrs Data	< 3 yrs Data
San Miguel	Telluride - 333 W. Colorado Ave.	19.9	354	3.1		

[1] Source: Colorado Air Quality Data Report 2010, available at http://www.colorado.gov/airquality/tech.aspx [2] Annual standard rescinded

3.1.5.1 Potential Impacts Analysis for Criteria Pollutants

A detailed air quality assessment, including modeling, of the mine was recently conducted to support APCD permitting of the Sage Creek mine at currently authorized production rates. The current APCD permit issued by the State authorizes up to 2.0 million tons of Run of the Mine (ROM) coal to be produced and processed annually. ROM coal includes any produced waste aggregates separated from the coal product that is sold from the mine.

A near field dispersion model (AERMOD), and a subsequent analysis conducted by CDPHE, was accomplished for the Sage Creek mine in May, 2010 and August, 2010, respectively. The modeling protocol simulated multiple operating scenarios and included a cumulative impact assessment by aggregating nearby facilities including: The Twentymile Coal Co. Foidel Creek Mine, Hayden Power Plant, Connell Pit, Routt County Landfill, Milner Landfill, and Mesa Gravel Pit, was approved by CDPHE prior to running the model. The modeled pollutants included stationary and fugitive sources of PM_{10} and $PM_{2.5}$, as these are the primary pollutants of concern emitted from aggregate handling and mining operations, as well as CO and SO_2. The model did not predict any significant impact level exceedances to ambient air quality resulting from Sage Creek mine operations, and subsequently APCD issued the initial approval permit for the mine.

As related to railway emissions, in March 2008, EPA finalized a three part program that will dramatically reduce emissions from diesel locomotives of all types -- line-haul, switch, and passenger rail. The rule will cut PM emissions from these engines by as much as 90 percent and NOx emissions by as much as 80 percent when fully implemented. The rule sets new emission standards for existing locomotives when they are remanufactured--to take effect as soon as certified systems are available, as early as 2008. The rule also sets Tier 3 emission standards for newly-built locomotives, provisions for clean switch locomotives, and idle reduction requirements for new and remanufactured locomotives. Finally, the rule establishes long-term, Tier 4, standards for newly-built engines based on the application of high-efficiency catalytic after treatment technology, beginning in 2015. Therefore, it is reasonable to conclude that rail emissions in Routt County going forward should continue to substantially decrease in the near future, and ultimately provide a benefit to the surrounding communities and environment.

Although the mine will employ LDGT and LDDT vehicles to conduct daily operations, these sources of emissions are insignificant compared to the heavy equipment sources. Further, their use should only increase slightly over the current intensity levels as compared to the Foidel Creek mine's current operations. Therefore, it is likely their continued use and any associated increase will have a negligible effect on area air quality. With respect to all mobile sources at the site, emissions from these sources are not expected to impact regional air quality due to the fact that they are not significant in the context of the regional county emissions inventory, any increase in emissions will be offset by decreasing emissions at the Foidel Creek mine when production winds down, and the fleet should have decreasing emissions as a whole as changes are made to upgrade to newer equipment in the future.

With respect to potential ozone formation, the county level analysis of the emissions inventory suggests the region is potentially NO_X limited. Therefore, to effectively limit any potential for ozone formation due to area emissions, control methods should focus on reducing NO_X emissions. By continuing to limit the minor reaction species, ozone formation potential from area emissions should remain small. The reader should be advised that only full scale photochemical grid modeling (which is beyond the scope of this EA) can reasonably predict the limiting reactant. BLM provides the above assertion based on reasonably available literature analyzing potential ozone formation in rural areas during the typical ozone season (i.e. summer). The Sage Creek

mine sources (including all of the diesel fired mobile sources) and associated processing equipment at the Foidel Creek mine are not significant sources of VOC emissions (the photochemical reactivity potential of methane in the troposphere is considered negligible (40 C.F.R. § 51.100 (s))), and therefore the mine's operations are not expected to contribute significantly to any regional ozone formation potential.

Ultimately, any near or far field impacts from criteria or HAP emissions associated with most of the indirect emissions sources will or have received analysis (and most likely permitting) from their respective regulatory agencies. Therefore, this action should not cause or contribute to the likeliness, frequency, or increasing severity of any detrimental impacts in areas at those respective sources.

3.1.5.2 Potential Impacts Analysis for Greenhouse Gas Pollutants

According to the U.S. Global Change Research Program (2009), global warming is unequivocal, and the global warming that has occurred over the past 50 years is primarily human-caused. Standardized protocols designed to measure factors that may contribute to climate change, and to quantify climatic impacts, are presently unavailable. As a consequence, impact assessment of specific impacts related to anthropogenic activities on global climate change cannot be accurately estimated. Moreover, specific levels of significance have not yet been established by regulatory agencies. Therefore, climate change analysis for the purpose of this environmental assessment within this air quality section is limited to accounting for GHG emissions changes that would contribute incrementally to climate change. Qualitative and quantitative evaluations of potential contributing factors are included where appropriate and practicable.

Methane emissions associated with the Sage Creek mine are anticipated to be very low when compared to other Colorado underground coal mines. The geology of the surrounding strata and composition of the coal itself produce very little emissions during current room and pillar mining. This method of mining does not cause a collapse of the overburden above the seam when the coal is removed and would not allow for any additional potential fugitive releases. Further, no gob vent boreholes (GVB) will be drilled in advance of the mining to adequately provide for the health and safety of the miners, since emission of any methane liberated can be adequately managed via the main vent fans at the facility. Methane emissions estimates are provided in the direct emissions table above. The estimations are based on current emission levels of the nearby Foidel Creek mine, and have been scaled to the authorized production levels at the Sage Creek mine. It is also important to note that the Foidel Creek mine is a long wall mine and methane emissions on a production basis should be higher per ton of coal produced versus those anticipated initially at the Sage Creek Mine.

Approximately 10.5 percent of U.S. emissions of methane come from underground coal mining activities (EPA 2010). Based upon the Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2010 (Draft), February, 27, 2012, and the Final Colorado Greenhouse Gas Inventory and Reference Case Projections 1990-2020, October 2007, the total coal mining related methane emissions (CMM) in 2009 and 2005 were 70.10 tg (teragrams=one million metric tons), and 4.9Tg on a CO_2e basis for the US and Colorado, respectively. Estimated total CMM emissions from the Proposed Action are approximately 298 short tons of CO_2 equivalent (at full authorized production) or 0.0055% and 0.0004% of the total calculated CO_2 equivalent emissions of CMM from Colorado and the U.S. Based on BLM's analysis, all of the GHG emissions from the Proposed Action are equivalent to 0.0273 tg on a CO_2e basis. This represents approximately

0.0235% & 0.0004% of all the gross GHG emissions (does not consider GHG sinks, i.e. "net emissions") from Colorado (2005 – 116.1Tg) and the US (2009 – 6,643Tg), respectively. If the calculated GHG emissions were compared with the global figures (2005 CO2 equivalent emissions of 26,544tg, ―World Development Report 2010: Development and Climate Change, World Bank, 2010), the relative significance of the impact to the global scale of GHG emissions would be even further negligible.

Regardless of the accuracy of emission estimates, predicting the degree of impact any single emitter of GHGs may have on global climate change, or on the changes to biotic and abiotic systems that accompany climate change, is not possible at this time. As such, the controversy is to what extent GHG emissions resulting from continued mining may contribute to global climate change, as well as the accompanying changes to natural systems cannot be quantified or predicted. The degree to which any observable changes can, or would be, attributable to the Proposed Action cannot be reasonably predicted at this time.

3.1.5.3 No Action Alternative

Under the No Action Alternative, the Sage Creek LBA area would not be approved for mining. Criteria, HAP, and GHG emission associated with the proposed mining at Sage Creek would not occur.

3.1.6 Mitigation

3.1.6.1 Criteria Pollutant Emissions

Mitigation measures and emissions controls would be implemented to reduce particulate matter/fugitive dust emissions during construction and ongoing production activities. Fugitive emissions resulting from all vehicles traveling on non-paved surfaces during all project phases would be controlled utilizing water, chemical suppression, or a combination of the two by applying frequently or as needed to the non-paved road surfaces and in accordance with any permit condition or approved fugitive dust control plan required by APCD. Storage piles would be watered as necessary to limit wind erosion potential and reduce fugitive emissions. Most of the coal transfer points and processing activities taking place at the Foidel Creek facilities (where the Sage Creek mine's coal is to be processed and loaded out) are either enclosed, employ moisture controls, or use technologies such as bag houses and wet scrubbers to control emissions in accordance with the authorizing air quality permit requirements.

It is assumed the facilities would continue to comply with their APCD issued air emissions permit provisions, and any other regulatory requirements the facility is subject to, now or in the near future (GHG emissions reductions, methane capture, New Source Performance Standards, etc.).

3.1.6.2 Greenhouse Gas Emissions

With regard to production activities at the mine, methane liberation from the mine may be reduced through mine planning, sealing previously mined areas, and degasification efforts. Although no dedicated methane drainage system will be employed at the mine due to the inherently low levels of methane originating from the overburden and mine itself, VAM controls should still be considered in light of the future expansion of operations currently being considered by the mine operator.

3.1.6.3 No Action Alternative

Under the No Action Alternative, the Sage Creek LBA area would not be approved for mining. Current levels of methane liberation, and emissions associated with the existing mine plan, would continue until mining is completed. The facility would continue to comply with their APCD issued air emissions permit provisions, and any other regulatory requirements the facility is subject to, now or in the near future (GHG emissions reductions, methane capture, New Source Performance Standards, etc.). Criteria, HAP, and GHG emission associated with the proposed mining at Sage Creek would not occur.

3.2 CULTURAL RESOURCES

3.2.1 Affected Environment

The leasing of federally owned coal through an LBA is considered an undertaking under Section 106 of the National Historic Preservation Act (NHPA).

The BLM has the legal responsibility to take into account the effects of its actions on cultural resources located on federal land. The BLM Manual 8100 Series, the Colorado State Protocol and BLM Colorado Handbook of Guidelines and Procedures for Identification, Evaluation, and Mitigation of Cultural Resources provide guidance on how to accomplish Section 106 requirements with the appropriate cultural resource standards.

Section 106 of NHPA requires federal agencies to: 1) inventory cultural resources to be affected by federal undertakings, 2) evaluate the importance of cultural resources by determining their eligibility to the National Register of Historic Places (National Register), and 3) consult with the federal and state preservation agencies regarding inventory results, National Register eligibility determinations, and proposed methods to avoid or mitigate impact to eligible sites. Within the state of Colorado, BLM's NHPA obligations are carried out under a Programmatic Agreement between BLM, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer. If the undertaking is determined to have "no effect" or "no adverse effect" by the BLM Little Snake Field Office archaeologist, then it may proceed under the terms of the Programmatic Agreement. If the undertaking is determined to have "adverse effects" then consultation would be initiated with the Colorado State Historic Preservation Office (SHPO).

The prehistoric and historic cultural context for northwestern Colorado has been described in several recent regional contexts. Reed and Metcalf's (1999) context for the Northern Colorado River Basin is applicable for the prehistoric context and historical contexts include overviews compiled by Frederic J. Athearn (1982) and Michael B. Husband (1984). A historical archaeology context has also been prepared for the state of Colorado by Church and others (2007).

The proposed undertaking project has undergone a cultural resource study. (Nelson, Amy, Michael D. Metcalf, and Kenneth P. Cannon, 2009, Peabody *Energy Twentymile Coal Company Sage Creek Subsidence Project: A Class II Cultural Resource Inventory* (BLM #54.1.2010).

Metcalf Archaeological Consultants, Eagle, CO.) The SHPO concurred on the design (Class II) of the study on September 16, 2008 (CHS# 53289; BLM 10.41.08).

This study identified twelve sites potentially eligible for listing on the National Register of Historic Places, or sites that need additional data to determine their eligibility. One of these sites (5MF.2737) is within the proposed lease area. The site consists of a prehistoric campsite that requires additional data before a recommendation can be made regarding its National Register eligibility.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

The environmental consequences of the proposed action have been researched by Metcalf Archaeological Consultants (Elkins and O'Brien 2011:5). This document states in pertinent part the following:

> There is very little information published on the actual effects of subsidence on cultural resources even though the potential effects of subsidence on archaeological sites has been considered for a number of longwall mining projects in the United States, Great Britain, and Australia. In addition, longwall mining has not yet taken place in the 2008 Cow Camp subsidence area and is not likely to occur until 2015 or later. Therefore, there is no comparative data available at this time regarding affects to previously recorded sites in the area.
>
> Most approval documents for longwall mines include some level of field inventory, recording, site avoidance, data recovery, and pre- and post-subsidence monitoring (e.g. MOA, Manti-LaSal National Forest, Canyon Fuel SUFCO Mine Plan 2000). As previously discussed, surface changes in the project area should be so subtle that the integrity of the surface stratigraphy and any archaeological materials that may be on or in the surface sediments should remain unchanged. However, it is recognized that some environments are subject to alteration due to subsidence–cliffs, water bodies, and springs for example, but flat-lying or undulating terrain is generally lowered gradually with few or no shear planes affecting surface sediments. Therefore, the effects on cultural resources from subsidence will depend upon the nature of the resource itself and on the nature of the landscape where the site is situated. Sites most sensitive to the effects of subsidence include rock shelter and rock art sites located on or beneath rock outcrops. Standing structures are also sensitive to the effects of subsidence.
>
> Site types not sensitive to the effects of subsidence would include surface and shallowly buried historic and prehistoric sites located in open terrain away from drainage channels and floodplains. Sites where the effects of subsidence have not been adequately documented include buried and/or stratified archaeological sites, and sites located in proximity to streams whose gradients and courses might be slightly altered by subsidence and a resulting change in erosion patterns. Changes in the

floodplain hold little potential for disturbance simply because those sediments are so recent. The areas of concern, however, are the terraces and benches that parallel the floodplain which may be impacted by lateral channel migration and increased erosion in situations where those surfaces see a relative increase in height above the floodplain.

Cliff bands and unstable or steep slopes have potential to collapse or slump during or following subsidence, as clearly demonstrated by the cliff fall above the current mine headquarters where MAC excavated the Red Army Rockshelter, 5RT345, in 1993 and 1994 (Pool 1997). This disturbance was anticipated by the mine, therefore mitigation of the site was initiated. This site example illustrates that severe subsidence would certainly have an impact on sites found in these landscapes, particular rock shelter sites and rock art sites.

Finally, standing historic (or prehistoric) structures also have potential to be impacted by any differential settling associated with subsidence. In this particular project area, no prehistoric structural remains are anticipated (given the terrain, and recent uses as open pasture and hayfields), but there is potential for historic Euro American structures such as houses, barns and other buildings, primarily associated with ranching.

One archaeological site (5MF.2737) has been discovered with the proposed lease area. This site has the potential to be adversely affected by the undertaking. The proposed LBA may proceed as described with the following mitigative measures in place.

The site must be reviewed at the mine plan permitting stage to determine if mitigation is required. If appropriate, mitigation will be developed in consultations with the SHPO.

3.2.2.2 Environmental Consequences, No Action Alternative

None

3.2.3 Mitigation

3.2.3.1 Proposed Action

1. Data recovery may be required at 5MF.2737 if the site is determined eligible for the National Register. The site must be reviewed at the mine plan permitting stage to determine if mitigation is required. If appropriate, mitigation will be developed in consultations with SHPO.

2. Any cultural and/or paleontological (fossil) resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall

suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and the authorized officer will make any decision as to proper mitigation measures after consulting with the holder.

3. The operator is responsible for informing all persons who are associated with the operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are encountered or uncovered during any project activities, the operator is to immediately stop activities in the immediate vicinity of the find and immediately contact the authorized officer (AO) at (970) 826-5000. Within five working days, the AO will inform the operator as to:

   - Whether the materials appear eligible for the National Register of Historic Places;
   - The mitigation measures the operator will likely have to undertake before the identified area can be used for project activities again; and
   - Pursuant to 43 CFR 10.4(g) (Federal Register Notice, Monday, December 4, 1995, Vol. 60, No. 232) the holder of this authorization must notify the AO, by telephone at (970) 826-5000, and with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), you must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the authorized officer.

4. If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.

3.2.3.2 Mitigation, No Action Alternative
None

3.3 ENVIRONMENTAL JUSTICE

3.3.1 Affected Environment
Executive Order No. 12898 on Environmental Justice, regarding how federal actions may impact minority and low-income populations, was issued on February 11, 1994. The purpose of the order is to identify and address, as appropriate, disproportionately high and adverse human health and

environmental impacts resulting from programs, policies, or activities on minority or low-income populations.

The LBA is located in an area of isolated dwellings where mining, oil and gas production, and ranching are the primary economic activities. There are no significant populations of minority, low-income, or tribal groups in the project area.

3.3.2 Environmental Consequences, both alternatives

The LBA is relatively isolated from population centers, so no populations would be adversely affected by physical or socioeconomic impacts of either alternative. Neither alternative would directly affect the social, cultural or economic well-being and health of Native American, minority or low-income populations.

3.3.3 Mitigation, both alternatives

None

3.4 INVASIVE, NONNATIVE SPECIES

3.4.1 Affected Environment

Houndstongue, hoary cress (whitetop), Canada thistle, and other biennial thistles are known to occur in this area. There is the potential for other noxious weeds, such as Dalmatian toadflax, yellow toadflax, leafy spurge, knapweeds, perennial pepperweed and others, to exist and spread in the area of the proposed action.

3.4.2 Environmental Consequences,

3.4.2.1 Proposed Action

Since recovery of the Federal coal in the lease-by-application will be by underground mining methods with no surface disturbance, it is not anticipated that there would be an increase of noxious or invasive species throughout the affected area.

3.4.2.2 Environmental Consequences, No Action

The lease-by-application would be denied and invasive species would not be affected.

3.4.3 Mitigation, both alternatives

None

3.5 LANDS WITH WILDERNESS CHARACTERISTICS

3.5.1 Affected Environment

The proposed project areas were analyzed for lands with wilderness characteristics under WO-IM 2011-154, *Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans*; based on this analysis, no proposed project areas are subject to WO-IM 2011-154. All proposed project

areas are either on split estate in which BLM does not control the surface, or because GIS analysis for the areas where BLM controls the surface demonstrates that no leases are in areas that meet the minimum size requirements for an inventory finding of the presence of characteristics. Size requirements are based on whether parcels are within roadless areas greater than 5,000 acres or are directly adjacent to designated wilderness or WSAs.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action
Subject to WO-IM 2011-154 and in accordance with BLM policy, the proposed project area was evaluated for suitability as lands with wilderness characteristics. The proposed project area is on split estate and did not meet the roadless criteria for an area greater than 5,000 acres. Therefore, the proposed action would not affect lands with wilderness characteristics.

3.5.2.2 Environmental Consequences, No Action
There would be no impacts to lands with wilderness characteristics from the No Action Alternative.

3.5.3 Mitigation, both alternatives
None

3.6 MIGRATORY BIRDS

3.6.1 Affected Environment
BLM Instruction Memorandum No. 2008-050 provides guidance towards meeting the BLM's responsibilities under the Migratory Bird Treaty Act (MBTA) and Executive Order (EO) 13186. The guidance emphasizes management of habitat for species of conservation concern by avoiding or minimizing negative impacts and restoring and enhancing habitat quality. The proposed coal lease area provides potential habitats for Brewer's sparrow and sage sparrow. Both species are listed on the U.S. Fish & Wildlife Service's 2008 Birds of Conservation Concern List.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action
It is possible that subsidence resulting from underground mining activities could have an impact on nesting Brewer's sparrows and sage sparrows. Subsidence could disrupt nesting during the breeding season causing a loss of the nest; however the chances of a take would be low and disturbed sparrows may relocate and nest again.

3.6.2.2 Environmental Consequences, No Action
There would be no impacts to either Brewer's sparrow or sage sparrow as a result of the No Action Alternative.

3.6.3 Mitigation, both alternatives

None

3.7 NATIVE AMERICAN RELIGIOUS CONCERNS

Letters were sent to the Uinta and Ouray Tribal Council, Southern Ute Tribal Council, Ute Mountain Utes Tribal Council, Shoshoni Tribal Historic Preservation Officer, and the Colorado Commission of Indian Affairs in the spring of 2011 discussing upcoming projects the BLM would be working on in FY10 and FY11. Letters were followed up with phone calls. No comments were received (Letters on file at the Little Snake Field Office, Craig, Colorado.)

3.8 SOCIO-ECONOMICS

3.8.1 Affected Environment

The social and economic study area for the proposed lease action and associated mining includes Routt and Moffat counties and the communities of Steamboat Springs, Oak Creek, Hayden and Craig. These communities currently provide the workforce for the Foidel Creek Mine that will transition to the Sage Creek Mine, as well as providing mining services, retail, business and consumer services in the area. Steamboat Springs is the county seat of Routt County; Craig is the county seat of Moffat County.

Population

Table 6 presents basic population and demographic information for Moffat County and the state of Colorado. Although the lease and mine are in Routt County, well over half the workforce resides in Moffat County. For that reason, the demographics of Moffat County are presented here, as the greater influence would be on the residents of Moffat County.

Table 6. Population by Category, 2000 and 2009, Moffat County and the State of Colorado

Population	Moffat County	Colorado
2000		
2009		
% Change	+6%	+16.8%
Male (2009)	51.8%	50.4%
Female (2009)	48.2%	49.6%
Under 5 years	7.7%	7.3%
Under 18 years	26.5%	24.4%
65 years and over	9.4%	10.6%
% Minority (2008)	19.2%	29.3%
% Below poverty (2008)	9.5%	11.2%

Source: US Census Bureau, http://quickfacts.census.gov/qfd/states/08/08051.html

Moffat County comprises 4,742.25 square miles with 2.8 people per square mile and a total

population of 13,980 people in 2009. Moffat County grew by almost 800 people between 2000 and 2009. According to the Sonoran Institute (2004), Moffat County grew slower than the state but faster than the nation between 1970 and 2000, with an annual average growth rate of 0.67%. The median age in Moffat County is 35 years old, with 26.5 % of the population being under the age of 18 and almost 9.5% being 65 years or older. Over 79.6% of the people age 25 and older in Moffat County have graduated from high school, and just over 12% have graduated from college (US Census Bureau 2001).

The town of Craig is the largest town in Moffat County with a 2000 population of 9,190, an increase of 1,053 since 1990. Other communities in the county include Maybell (2000 population of 370), and Dinosaur (2000 population of 335), (US Census Bureau 2000). The 2009 US Census reports that there were 6,139 housing units in Moffat County that housed 4,983 households, indicating a vacancy rate of approximately 18.8 %. Approximately eight per cent of rental units were classified as vacant. There were 2.43 persons per household. Moffat County had a home ownership rate of 72.1% in 2000, well above the state average of 67.3 %. The median value of an owner occupied housing unit was $104,600, well below the state average of $166,600 (US Census Bureau 2001).

Economic Resources

The area of influence for economic resources is comprised of Routt and Moffat County. Moffat County is the county of residence for the majority of the mining personnel and supports most of the indirect employment that provides supplies and services to mine workers and their families.

Mining employment in Moffat County in 2009 was 1,000 full time jobs. (http://www.bls.gov/lau/laucntycur14.txt).

In 2009, Peabody Energy's Twentymile Coal Co., Foidel Creek Mine employed an average of 490 full and part time workers with an annual payroll of approximately $28.3 million. These workers will gradually move to the Sage Creek Mine. Average mining wages in 2009 were more than twice the average wage for other employment sectors in the project area ($23,254) (Region 10 Review, 2003). Peabody Energy estimates that for every one coal job, 3 service-sector jobs are supported. The Sage Creek Mine is expected to spend many dollars locally for materials, supplies, and services. In addition, the Sage Creek Mine would contribute royalty and tax payments to the local and national economy. Peabody contributes to local charities such as United Way, supports 4H, and also helps to sponsor local community events.

Identification of Minority and Low Income Populations

For purposes of this section, minority and low income populations are defined as follows:

> *Minority populations* are persons of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.
>
> *Low-income populations* are persons living below the poverty level. In 2000, the poverty weighted average threshold for a family of four was $17,603 and $8,794 for an unrelated

individual. Estimates of these two populations were then developed to determine if environmental justice populations exist in Moffat County (see Table 6).

In 2009, Moffat County had a population of 31,322 persons, of which approximately 5,137 (16.4%) were minorities and approximately 3,790 (12.1%) were living below the poverty level. Minority populations were lower in Moffat County than in the state of Colorado; the low-income population in Moffat County was higher than for the state of Colorado. The Council on Environmental Quality (CEQ) identifies minority and low income groups as Environmental Justice populations when either (1) the population of the affected area exceeds 50 % or (2) the population percentage in the affected area is meaningfully greater (generally taken as being at least 10% more) than the population percentage in the general population of the region or state. Neither the minority population percentage nor the low-income population percentage meets the CEQ guidelines. As a result, it is assumed that no environmental justice populations exist within the area of influence, and no impact analysis is required.

Protection of Children

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 21, 1997), recognizes a growing body of scientific knowledge which demonstrates children may suffer disproportionately from environmental health risks and safety risks. These risks arise because (1) children's bodily systems are not fully developed, (2) children eat, drink, and breathe more in proportion to their body weight, (3) their size and weight may diminish protection from standard safety features, and (4) their behavior patterns may make them more susceptible to accidents. Based on these factors, the President directed each Federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The President also directed each Federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Children are very seldom present at the coal mining facilities. On such occasions, the coal mining companies have taken and would continue to take precautions for the safety of children by using a number of means, including fencing, limitations on access to certain areas, and provision of adult supervision. No additional impact analysis is required.

3.8.2Environmental Consequences

3.8.2.1 Proposed Action

Assuming that the coal in the LBA is approved and the existing Twentymile Coal Company's Foidel Creek mine's operations and facilities would be used, there would be no new or added employment at the Sage Creek Mine. No additional demand for housing or municipal services would be anticipated. Mining operations would be extended throughout the period required to mine recoverable coal reserves. This extension of mining operations would also extend the annual payroll, local expenditures, and taxes and royalty payments for approximately a year or more.

In response to an LBA, a lease sale may be held. Bonus bids result from the open, competitive

auction process when a lease is offered. The successful competitive bid must not be less than the Fair Market Value (FMV) of the coal on a per ton basis. Royalties from federal coal mined by underground methods is 8 percent of the gross sales price. The BLM receives annual payments from coal lease holders based on rents at not less than $3.00 per acre. The rental of the lease area would be $1,200.00 per year for this 400 acre lease. The revenues from the bonus bid, rental, and royalties of a lease go to US Treasury General Fund and to the State of Colorado. Royalty payments are 8% of the value of the coal removed from an underground mine (43 CFR 3473). Royalties from the Federal coal are distributed in the following way: 50% returns to the Federal treasury in the general fund. The other 50% is returned to the State where the coal was mined, with a portion of that percentage being returned to the county where the coal was mined. In Colorado, those funds are managed by the State Department of Local Affairs in the Energy Impact Fund. These monies are distributed on a grant-like basis to counties affected by energy resource development for community benefit projects.

3.8.2.2 Environmental Consequences, No Action

Under the No Action Alternative, the primary impact would be that the estimated 3.2 million tons of recoverable federal coal would be permanently bypassed. Mining of the reserves at the Sage Creek Mine would continue at existing rates until the coal reserves are depleted. Reductions in jobs and associated salaries, local expenditures, royalty and tax payments would not be realized until after the reserves are depleted. The Federal government (US Treasury) and the State of Colorado would not receive the rents and royalties associated with mining the coal in the LBA. Royalties from underground coal are 8% of the sales price. Using November, 2010 average price of $43.50 per ton, the lost revenues from the sale of 3.2 million tons of recoverable coal at 8% would be $11,136,000.

3.8.3 Mitigation, both alternatives

None

3.9 SOILS

3.9.1 Affected Environment

Soils in the LBA area are primarily derived from Lewis Shale and the Williams Fork Formation although smaller areas of Twentymile and Kit-Trout Creek sandstones have also contributed parent materials. Impass silty clay loam, 12 to 25 percent slopes; Impass silty clay loam, 25 to 40 percent slopes; Elkhead clay loam, 0 to 5 percent slopes; Lintim loam, 3 to 12 percent slopes; Impass silty clay loam, 3 to 12 percent slopes; and Phippsberg clay loam, 25 to 65 percent slopes are the predominant soils mapped overlying the lease-by-application area. All of the soils have deep soil profiles and high water holding capacities except for the Phippsberg which typically has a depth of 20 to 33 inches over weathered shale bedrock with a low water holding capacity. Permeability through the most restrictive soil layer of these soils is moderately low and all have a high shrink swell potential. These soils have a moderately high to high runoff rate.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action
The soil resource overlying the zone of subsidence is expected to remain intact with regards to important characteristics and properties. Some fracturing or loosening of the soil profile may occur in areas where the surface is flexed from the irregular pattern of subsidence and to a lesser degree some compression may result in and near the areas of maximum subsidence. These modifications to the soil profile could result in increased percolation of water in areas that were flexed and reduced percolation in areas which were compressed. These slight modifications to the soil profile are not expected to cause appreciable changes to the characteristics or properties of the soils, especially with regards to fertility or available soil moisture.

3.9.2.2 Environmental Consequences, No Action
Soils would not be affected.

3.9.3 Mitigation, both alternatives
None

3.10 THREATENED AND ENDANGERED ANIMAL SPECIES

3.10.1 Affected Environment
There are no threatened or endangered species or habitats for such species present within the proposed LBA area.

The following is a list of threatened, endangered and candidate and proposed species of Routt County, CO:

Bonytail*	Gila elegans	Endangered
Canada lynx	Lynx canadensis	Threatened
Colorado pikeminnow*	Ptychocheilus lucius	Endangered
Greater Sage-grouse	Centrocercus urophasianus	Candidate
Greenback cutthroat trout#	Oncorhynchus clarki stomias	Threatened
Humpback chub*	Gila cypha	Endangered
Razorback sucker*	Xyrauchen texanus	Endangered
Yellow-billed cuckoo	Coccyzus	Candidate

Symbols:
* Water depletions in the Upper Colorado River and San Juan River Basins, may affect the species and/or critical habitat in downstream reaches in other states.
# Recent genetic tests identified cutthroat population as GB linage, therefore, consultation is an interim measure until genetic and taxonomic issues are resolved.

The proposed project area does provide breeding and nesting habitat for the candidate greater sage-grouse and Columbian sharp-tailed grouse. The greater sage-grouse is a federally listed

candidate species and both species are BLM special status species.

The proposed LBA area does not provide habitat for the Canada Lynx or Yellow-billed cuckoo. Critical habitat for the Bonytail, Colorado pikeminnow, Humpback chub, Razorback sucker and Greenback cutthroat trout is located downstream from the project area.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

There would be no impacts to threatened and endangered species or their habitats. The only potential surface impact that may result from issuing this LBA is subsidence. Surface effects from subsidence are minor and generally limited to shallow cracks which close within a few weeks. These cracks will not affect the breeding and nesting habitat of sage-grouse or Columbian sharp-tailed grouse. The proposed action does not require any surface facilities and no new disturbance to grouse is expected to occur. In compliance with the provisions of the Colorado Water Control Act and the Federal Water Pollution Control Act, the Sage Creek Mining, LLC is authorized to discharge from the Sage Creek Mine Complex to Grassy Creek and tributaries that contribute to Fish Creek and Grassy Creek in accordance with effluent limitations, monitoring requirements and other conditions set forth in the Colorado Discharge Permit System (CDPS) Permit Number CO-0048275.

In July 2008, the BLM prepared a Programmatic Biological Assessment (PBA) that addresses water depleting activities in the Colorado River Basin. In response to the BLM's PBA, the FWS issued a Programmatic Biological Opinion (PBO) (#ES/GJ-6-CO-08-F-0010) on February 25, 2009, which determined that water depletions from the Colorado River Basin resulting from BLM actions described in the PBO are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker or result in the destruction or adverse modification of their critical habitat. The PBO addresses internal and external BLM projects including impoundments, diversions, water wells, pipelines, and spring developments. The FWS determined that projects that fit under the umbrella of the PBA would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Upper Colorado River Basin if they deplete relatively small amounts of water (less than 100 acre-feet [AF]) and the BLM makes a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in the amount equal to the average annual acre-feet depleted by each project.

The PBO instructed the BLM to make an annual payment to the National Fish and Wildlife Foundation (NFWF) to cover all BLM authorized actions that result in water depletions. The Sage Creek Coal Lease will deplete 28.13 AF annually. The depletion fee for this project is $534.19 ($18.99 x 28.13 AF). This project has been entered into the Little Snake Field Office water depletion log which is submitted to the BLM Colorado State Office (CSO) at the end of the Fiscal Year. The BLM CSO is responsible for paying depletion fees based on the annual statewide total.

3.10.2.2 Environmental Consequences, No Action
There would be no impacts to threatened, endangered or special status species or their habitats as a result of the No Action Alternative.

3.10.2 Mitigation, both alternatives

3.10.2.1 Proposed Action
None

3.10.2.2 No Action
None

3.11 T&E AND SENSITIVE PLANTS

3.11.1 Affected Environment
There are no federally listed threatened or endangered or BLM sensitive plant species in the vicinity of the proposed action.

3.11.2 Environmental Consequences, both alternatives
None

3.11.3 Mitigative Measures, both alternatives
None

3.12 WASTES, HAZARDOUS OR SOLID

3.12.1 Affected Environment
Potential sources of hazardous or solid waste materials in the project area would include spilling, leaking, or dumping of hazardous substances, petroleum products, and/or solid waste associated with coal development or agricultural or livestock activities. No such hazardous materials are known to be present on the proposed PSCM 400 acre lease site at this time. Once the lease area is in production, petroleum products and solvents would be used underground as part of general operations. Use of these products would comply with all applicable state and federal regulations, as described in this section.

Hazardous wastes produced by current mining activities at the PSCM are handled in compliance with regulations promulgated under the Resource Conservation and Recovery Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, Department of Transportation, and the federal Clean Air Act (CAA). Mining operations must also comply with all state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

Disposal requirements for waste rock/ore derived from coal mining operations are based on whether the waste material is determined to be acid-forming and/or toxic-forming. If the material is determined to be non-acid-forming or non-toxic-forming, there are generally no

restrictions on disposal. The material may be stockpiled within the permit area or disposed of per the Disposal of Excess Spoil, Coal Mine Waste Bank, or Coal Mine Waste Regulations (2 CCR 407-2.2.04.09 – 407-2.2.04.11). Acid-forming and toxic-forming waste material must be disposed of in accordance with 2 CCR 407-2.4.05.8 (Acid-forming and Toxic-forming Spoil), 2 CCR 407-2.4.10.1 (Coal Mine Waste Banks General Requirements), and 2 CCR 407-2.4.14.3.

The 400 acre lease area is limited to underground mining. Limited volumes of underground development waste will be generated from overcast development and roof falls. To the extent practical, this material will be disposed of underground in mined-out areas. Coal refuse material (non-specification coal) and incombustible waste rock generated at the PSCM will be transported to the surface by conveyor, segregated and transported to Foidel Creek Mine's approved refuse disposal area for permanent placement. Based on sampling and analysis of the geologic materials associated with Wadge seam in the PSCM permit area and at the Foidel Creek Mine, the associated strata above and below the coal seam have little or no potential to generate acid- or toxic-forming refuse materials.

3.12.2 Environmental Consequences, both actions

None

3.12.3 Mitigation, both alternatives

None

3.13 WATER QUALITY - GROUND

3.13.1 Affected Environment

The Basal Williams Fork Aquifer forms a local water bearing unit comprised of three coal seams (Lennox, Wadge and Wolf Creek) and discontinuous sandstones. These three coal seams constitute locally important water bearing units, confined above by 500 ft. of marine shale and below by a confining shale layer. Beneficial use of groundwater within this area is minimal due to the limited availability and quality and the relatively great depth to groundwater (+/-600 ft.). Recharge to the groundwater occurs primarily as infiltration of precipitation and snowmelt in upland areas beyond the 400 acre LBA (Robson and Stewart, 1990). The mine workings will be within saturated portions of the bedrock, causing groundwater inflow to the workings at rates less than 55 gallons per minute. Dewatering of the workings will be necessary. The groundwater from the workings will be recycled and reused for underground mining operations. The drawdown due to mine dewatering will be less than five feet within 900 ft. of the mine and will decrease with time and distance. The quality of the inflow groundwater would be similar to the quality of the groundwater in the overburden and Wadge coal.

3.13.2 Environmental Consequences

3.13.2.1 Proposed Action

Minor changes in ground water would occur. These changes will generally be confined to the mine and immediately adjacent areas by the relatively low permeability of the geologic units and the limited hydrologic connection with other more permeable units. No ground water users will be affected since existing ground water use is in the Trout Creek and Twentymile aquifers, which are isolated from the affected units by thick, relatively impermeable shale and/or ash deposits. Monitor wells exist to monitor ground water quality; reports are submitted annually. With proper mining practices, there would be no significant environmental consequences to groundwater.

3.13.2.2 Environmental Consequences, No Action
There would be no impact to ground water.

3.13.3 Mitigation, both alternatives
None

3.14 WATER QUALITY - SURFACE

3.14.1 Affected Environment
Runoff from the area affected by the proposed action would flow to Fish Creek, a perennial tributary to Trout Creek, and Grassy Creek, a perennial tributary to the Yampa River. The water quality of Fish Creek must support Aquatic Life Cold 1, Recreation E, and Agricultural beneficial uses. Water quality of Grassy Creek must support Aquatic Life Warm 2, Recreation N, and Agricultural beneficial uses.

Longwall mining in the vicinity has occurred since about 1988 and runoff water from the subsided areas, as well as, mine inflows has flowed or been released into Fish Creek. The adjacent Foidel Creek mine operated by Twentymile Coal Company makes use of and recycles much of the mine inflow water in various mining activities, especially dust suppression. The subsequent handling and holding of this water tends to increase the total dissolved solids (TDS) levels.

The Colorado Department of Public Health and Environment, Water Quality Control Division has issued Colorado Discharge Permit System (CDPS) discharge permits to PSCM for various discharge points, including Fish Creek. At the Foidel Creek mine, current TDS levels in these creeks are monitored upstream of the mine activities and discharges are treated to meet CDPS discharge permit effluent limits. At the Sage Creek Mine, discharge water does not need to be treated; it meets water quality standards. It is unlikely that water would be discharged as most or all of the mine water encountered within the lease will be used for mine operations.

3.14.2 Environmental Consequences

3.14.2.1 Proposed Action
Subsidence of the ground surface likely would cause localized gradient changes stream channels and potential pooling. Additional sediments could be generated in the short term from overland flow across soil surfaces however localized deposition is expected to occur within the stream

channel, except during high runoff events. Slightly higher levels of TDS and Total Suspended Solids could result from sediment transport in the short term.

3.14.2.2 Environmental Consequences, No Action
Surface water quality would not be affected.

3.14.3 Mitigation, both alternatives
None

3.15 WETLANDS/RIPARIAN ZONES

3.15.1 Affected Environment
There is an unnamed drainage within the proposed coal LBA area on private surface land. There are no records of this drainage containing any riparian habitat.

3.15.2 Environmental Consequences

3.15.2.1 Proposed Action
Should there be riparian habitat within the unnamed drainage, there is a slight chance that subsidence could result in changes in flow patterns. There is little chance that there would be any effect to the habitat.

3.15.2.2 Environmental Consequences, No Action Alternative
There would be no impacts to riparian habitats as a result of the No Action Alternative.

3.15.3 Mitigation, both alternatives
None

3.16 WILDLIFE, TERRESTRIAL

3.16.1 Affected Environment
The proposed LBA area provides habitat for mule deer, pronghorn antelope and elk. This area does not provide severe winter habitats for any of these species. In addition to big game animals, small mammals, songbirds and reptiles may be found within the proposed LBA area at various times of the year.

3.16.2 Environmental Consequences

3.16.2.1 Proposed Action
It is possible that subsidence resulting from underground mining activities could have an insignificant impact on big game animals and is not likely to impact their habitat. Subsidence could result in the collapse of underground burrows resulting in some localized mortality to some individual wildlife. This impact is not likely to have impacts on any species populations.

3.16.2.2 Environmental Consequences, No Action

There would be no impacts to terrestrial wildlife species or their habitats as a result of the No Action Alternative.

3.16.3 Mitigation, both alternatives

None

3.17 CUMULATIVE IMPACTS SUMMARY

Cumulative effects are impacts on the environment which result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. The past and present actions in the area include coal mining, coal exploration, ranching, recreation, oil and gas exploration, and dispersed rural residential development. The following actions within the region are known or are reasonably foreseeable.

- May Oil and Gas Lease Sales
- Future Modifications of Sage Creek Mine (Exploration and LBAs)
- Future Modifications of Sage Creek Mine (Longwall)

The BLM does not authorize mining by issuing a lease for federal coal, but the impacts of mining the coal are considered in the cumulative impacts summary because it is a logical consequence of issuing a lease.

Past coal mining in the area includes the surface Energy Strip #1, the surface Yoast Mine, the surface Seneca I, Seneca II, and Seneca IIW Mines, the surface Johnson, the surface Commander Strip #1 and #3, the surface Fish, the surface Linholm, the underground Mt. Harris Mine and the surface Edna Mine. The underground Foidel Creek Mine has been operating since 1983. Historically, the surface has also been, and continues to be ranched; the area also supports wildlife. Reasonably foreseeable future actions include continued mining at the Foidel Creek Mine, mining at the Sage Creek Mine, coal exploration, future leasing of Federal coal, continued ranching activities, and continued dispersed residential development. The Foidel Creek Mine produces an average of 7.4 million tons of coal per year. Most of the coal is transported by an existing Union Pacific rail line. Trucks distribute the remaining coal to local markets. An application for a coal exploration license for the Sage Creek Mine has been submitted and approved. Coal exploration licenses are of short duration (2 years) with minimal (0.02 acres per hole) surface disturbance. A coal exploration hole takes about 3 days to complete. The surface disturbance is immediately reclaimed. The Sage Creek Coal exploration license is for 2 holes. This exploration license would have 0.04 acres of disturbance with approximately 6 days of exploration drilling activity, resulting in no significant cumulative impacts.

An LBA for 200 acres of underground coal has been submitted by Twentymile Coal Company for the Foidel Creek Mine. Additional applications for new coal lease applications and modifications

could be expected. It is likely that underground mining would continue for at least another five years or more. Cumulative impacts from the 200 acre lease application could include Green House Gases (GHG) from mine ventilation, noise, air quality, and invasive weeds. These cumulative impacts would be minor.

3.17.1 Topography and Physiography

Continued underground mining at the Sage Creek Mine would result in minor impacts to topography and physiography. While surface facilities are active, topsoil stockpiles, coal storage piles, buildings, and waste disposal areas would impact topography and physiography. After mining has stopped, these areas would be reclaimed. Land surfaces would be returned to within at most, 20 ft. of approximate original contour. Stringent re-vegetation requirements must be met. Cumulative impacts would be minor.

It is reasonably foreseeable that longwall mining would occur. Any failures in the underground works will not cause any measurable subsidence at the surface. Subsidence of up to 60 inches at these depths has been recorded in longwall areas at the Foidel Creek Mine with no material damage to structures such as Grassy Creek, County Road 27, and the 135 and 340 KV power lines. Cumulative impacts would be minor.

Dispersed rural residential development would have localized impacts due to the construction of buildings and roads. It is reasonably foreseeable that this development would remain dispersed; cumulative impacts would be minor.

3.17.2 Geology, Mineral Resources, and Paleontology

The removal of the Wadge seam by continuous miner and longwall mining would result in the permanent reduction of coal resources. Geologic and paleontological features in the overburden of the coal would subside in place and remain largely intact.

There are no oil or gas wells within the 400 acre lease area (Colorado Oil and Gas Conservation Commission, COGCC) or the permit area. Future foreseeable oil and gas drilling would be speculative. Based on the COGCC database, production from Routt County for oil has declined by 66% in the last 6 years. The 2005 oil production was 106,729 barrels; the 2011 oil production was 36,386 barrels. Production for gas in Routt County has declined by 70%. The 2005 gas production was 67,404 MCF (thousand cubic feet); 2011 gas production was 20,474 MCF. Oil and gas exploration would be short in duration. Surface disturbances would be reclaimed. Cumulative impacts would be minor.

3.17.4 Environmental Justice:

There would be no cumulative environmental justice effects from continued mining and other rural development in the Sage Creek area.

3.17.5 Socioeconomics:

Mining of the coal also has future foreseeable effects on socio-economics. The population centers

nearest to the Sage Creek Mine are the city of Steamboat Springs in Routt County, the communities of Oak Creek and Hayden in Routt County, and Craig in Moffat County. Presently, Peabody's Foidel Creek Mine is operating adjacent to the 400 acre LBA. In the past and presently, Peabody has been responsible for paying sales taxes, property taxes, royalties, and other payments. According to The Socioeconomic Impact of Sage Creek Mine on Routt County, Colorado, and Surrounding Areas (Tetra Tech 2010) Peabody Energy has paid the following:

- $4.2 million in property taxes.
- $1.3 million in sales and use taxes.
- $13.0 million in royalties.
- $1.0 million to the Abandoned Mine Fund.
- $7.9 million to the Black Lung Fund.
- In addition to taxes and other payments, Peabody made charitable donations of nearly $69,000 to area organizations.
- Peabody's sales from its Colorado mining operations in 2008 were approximately $255.1 million, generating additional sales by other businesses in Routt County of $107.4 million (Peabody 2009).
- Peabody employed 534 people in its Foidel Creek Mine operations in 2008, generating 1,242 additional jobs in the local economy (Peabody 2009).

According to the Peabody Sage Creek Mine Permit Application, Peabody proposes to construct and operate the Peabody Sage Creek Mine (PSCM) under an initial 5-year permit, with construction in Year 1 and coal production ranging from 0.5 million tons per year (MTPY) in Year 2 to 2 MTPY in Year 5 using continuous miners. If mining and market conditions are favorable, the mine could expand from continuous mining during the initial 5-year period to full scale longwall operations, producing as much as 8 MTPY over the mine's life. The Sage Creek Mine would replace the currently operating Foidel Creek Mine (CDRMS permit C-2009-087).

Peabody's Sage Creek Mine is proposed to gradually replace the Foidel Creek Mine. The cumulative effects on the estimated earnings on the wages and benefits to the local economy include wages and benefits to employees, income to local businesses, and taxes currently paid by Peabody due to the operation of the Foidel Creek Mine would continue with the operation of the Sage Creek Mine.

The cumulative socioeconomic effects of continued mining would include a constant level of employment, personal income, and federal, state and local revenues during the operation of the mine and the removal of that source of income when the mine is closed. Residential and other development activities are expected to increase the local population and infrastructure in the area.

On a cumulative basis, if the LBA were not approved, and not offered for sale, coal mining in the Twentymile Park Area is expected to continue at existing mines until existing reserves are depleted. At that point, the coal mining employment sector would be terminated. Mining the coal reserves in the LBA would increase the life of the mine. The cumulative social and economic effects of past, present and reasonably foreseeable actions in the Moffat County and Routt County area relative to coal mining operations are expected to extend the mining

employment sector proportionately to the length of the remaining reserves, so that jobs would not be lost.

3.17.6 Transportation Facilities and Access

Future mining operations and other development activities would maintain infrastructure for traffic access. The tax revenue generated from mining and other development would contribute to the maintenance of public roads. Coal from PSCM would be trucked on Routt County Road 27 to the existing processing facilities at Twentymile Coal Company's Foidel Creek Mine. The coal would be loaded onto trains at the existing Foidel Creek Mine facilities. Below is the PSCM production schedule:

PRODUCTION SCHEDULE					
YEAR	1	2	3	3/4	4/5
Tons Produced	0	500,000	1,500,000	2,000,000	2,000,000

No additional trains would be required to haul the coal to its destinations. Coal truck traffic is not expected to increase, since coal trucks that hauled coal from Foidel Creek to the Hayden Generating Station power plant have been replaced by a train. Trucks hauled approximately 2 million tons of coal each year to the Hayden Generating Station. The number of trucks needed to haul coal from Sage Creek to Foidel Creek mine for processing would be less for the first 3 years of Sage Creek production, and then would be approximately the same or less than the past number that hauled to Hayden Generating Station. With the closure of Foidel Creek mine in the next five years, coal truck traffic is expected to decrease as the Foidel Creek mine nears closure and Sage Creek begins development. As PSCM may be the replacement for Foidel Creek, the amount of daily traffic is expected to remain near current levels. Noise, air quality, animal road kills, and maintenance costs are also expected to remain near current levels and therefore produce minor cumulative impacts.

3.17.7 Air Quality

The cumulative impacts to air quality in the Sage Creek Mine area would result primarily from emissions of PM, NO_X, CO, CO_2, and CH_4 from the current and future mining of coal within the region. As previously stated, the long term plan for the Sage Creek Mine is to gradually replace declines in production from the nearby Foidel Creek Mine such that mining intensity for the region should not increase above currently authorized and evaluated levels. Thus, it can reasonably be anticipated that production at the Sage Creek mine will increase in the future, additional exploration licenses and LBAs for federal minerals will be filed with BLM for analysis, and if applicable approval, and any associated production increases or decreases between the two air emissions permits held by Peabody that cover the Sage Creek Mine's operations will be vetted by CDPHE prior to any authorizations being approved.

Although public interest has been expressed in the upcoming May 2012 oil and gas lease sale, no reasonably foreseeable cumulative actions can be determined at this time with respect to any quantities or spatial densities/locations of potential oil and gas wells and no timeline for any

potential development can be established. Typically, BLM will address potential impacts form oil and gas developments through the NEPA process when subsequent Applications for Permit to Drill (APDs) are filed and operators will provide pertinent details of their proposals and operations such that BLM staff can provide a range of mitigation alternatives based on the project and cumulative impacts projections. At the pre-lease stage any assumptions on development would be highly speculative and would need to account on economic factors such as supply, demand, and the current and projected price of natural gas. Further, the COGCC does not show any pending location or well permit approvals for Routt County, and therefore no emissions estimates can be made to predict any potential impacts to air quality at this time. However, when future APDs are received, BLM will perform the analysis and include any applicable cumulative impacts from the mine lease authorizations located within the region of influence of any well. Mining activities as well as other stationary sources of pollution related to air emissions are permitted by the Air Pollution Control Division of the CDPHE. The State imposes permitting limits and control measures in order to limit emissions of NAAQS pollutants. The State develops air quality attainment and maintenance plans in order to keep Colorado in compliance with the Federal NAAQS. Therefore, cumulative impacts are not anticipated to exceed NAAQS, or to push the region into non-attainment for any NAAQS, and should not result in any net change to baseline air quality. With respect to mobile source emissions, these sources are regulated as outlined above, and are not expected to cumulatively impact regional air quality. If the last 30 plus years of the CAA is any guide, then emissions from these sources should continue to decline as fleets age and are replaced by better controlled units, such that even with record years of Vehicle Miles Traveled (VMT), air quality in many areas of the county has vastly improved to the benefit of many local communities.

3.17.7.1 Climate Change

Continued mining, operation of mine surface facilities, and associated vehicle traffic, would result in minor cumulative contributions to the release of GHGs into the atmosphere. The BLM estimated the amount of GHG emissions that could be attributed to coal production as a result of the proposed lease. The mining, processing, and shipping of coal from the Sage Creek Mine would contribute to GHG emissions through carbon fuels used in mining (including fuel consumed by heavy equipment and stationary machinery), electricity used on site, methane released from mined coal, and rail transport of the coal. The use of the coal after it is mined has not been determined at this time; however, BLM assumed that the majority of the coal was used for coal fired electric generation as part of the total U.S. use of coal for electric generation. This also results in the production of GHGs (see indirect emissions above). Policies regulating specific levels of significance have not yet been established for GHG emissions. Given the state of the science, it is not possible to associate specific actions with the specific global impacts such as potential climate effects. Since there are no tools available to quantify incremental climate changes associated with these GHG emissions, the analysis cannot reach conclusions as to the extent or significance of the emissions on global climate. The potential impacts of climate change represent the cumulative aggregation of all worldwide GHG emissions. The Sage Creek lease would make an initial 400 acres of the Wadge coal seam available for mining. Coal production would be consistent with current regional production rates, and the anticipated release of GHGs would remain about the same as current rates.

3.17.8 Water Resources

Cumulative impacts to ground water are expected to be minimal due to marginal baseline quality, limited affected areas, distance between affected areas, low permeability, attenuation and dispersion, and limited current usage. The cumulative effects to the surface water system due to underground mining are expected to include increased runoff and erosion in the permit area, temporary changes in nearby stream flow regimes, and an increase in total dissolved solids. Surface water quantity is not expected to be impacted cumulatively in the region. Reduced stream flows due to a general lowering of the water table caused by mining would be more than offset by mine water discharge. Retention of surface water runoff in sediment ponds may alter the timing of runoff events but this alteration of timing should be immeasurable. Subsidence caused impact to the ground surface that would likely cause localized gradient changes in stream channels and potential pooling would be additive. Dispersed residential development may have a cumulative impact due to surface disturbance and use of groundwater for domestic purposes.

3.17.9 Soils

There would be no cumulative impacts to soils from continued subsidence. The soil over the mined areas would subside in place and remain largely intact. Surface disturbing activities associated with the surface facilities for the mine would be reclaimed to the pre-mining land use condition and would be focused on grazing and wildlife habitat. Similarly, other surface disturbing activities related to coal exploration would be reclaimed. Dispersed residential development would result in localized impacts to soils, but the overall cumulative impacts of these developments would be minor.

3.17.10 Vegetation

Minor subsidence impacts would not greatly impact vegetation communities. Re-vegetation at the surface facilities would be conducted as part of the reclamation process, and must meet stringent requirements. Cumulative impacts to vegetation from mining operations would be negligible. Grazing at the same intensity is expected to continue and would have a minor cumulative impact.

3.17.11 Wildlife

Other than what has already been analyzed, prolonged mining would result in negligible impacts to wildlife habitat and population dynamics. The surface disturbance from the Peabody Sage Creek Mine (PSCM) is located on the previously disturbed and reclaimed Seneca II Mine. The total area of surface disturbance at PSCM is 391 acres in a 10,164 acre permit; approximately 4 % of the permit area will have surface disturbance. Almost the entire surface disturbance is on previously disturbed surface mined land of the Seneca II mine. The development and operation of the PSCM would result in minimal short-term habitat loss for some species; the availability of immediately adjacent extensive habitat is expected to allow for their eventual recovery in the PSCM disturbed area. Cumulative impacts from mining operations would be negligible. Continued sustainable cattle grazing may result in some localized competition for habitat and food resources; however, this is not expected to change as compared to the competition that already exists between cattle and wildlife in the area.

Dispersed residential development is expected to continue in the area. This development could cause wildlife sensitive to human activity to seek habitat outside the area of development. The increased presence of houses, other buildings, fences, roads, and traffic would also alter the movement of big game animals, and would restrict hunting and other recreational opportunities. Wildlife and their habitats would still be present in the area; however, they would likely be altered or reduced.

3.17.12 Threatened, Endangered, and Special Status Species

There would be negligible cumulative impacts to threatened, endangered or special status species or habitat from continued mining and other development activities in the Sage Creek Mine area. No critical habitat was identified for any threatened or endangered vertebrate species in the Wildlife Baseline Report by ICF Jones and Stokes, February 2009. Due to the location and type of mine development of PSCM, the relatively common nature of the existing habitats and lack of critical or unique native habitats, the additional past and present mining in the immediate vicinity, cumulative impacts to threatened, endangered or special status species are expected to be minor.

Through the protection of the hydrologic balance in the PSCM mine permit, direct and indirect habitat impacts associated with consumptive water use at the PSCM and the potential this impact may have on the four federally listed aquatic vertebrate species were assessed and determined to have no impact. The Office of Surface Mining consulted with USFWS on March 11, 2010 on the PSCM. USFWS determined that the PSCM fit under the Yampa River PBO and PSCM would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Yampa River basin. Additionally, PSCM's various design and operation measures will be used to minimize impacts on fish and wildlife species. Dispersed residential development would also result in minimal surface disturbance to habitats in the area.

3.17.13 Cultural Resources

Surface changes in the project area from subsidence are expected to be so subtle that the integrity of the surface stratigraphy and any archaeological materials that may be on or in the surface sediments should remain unchanged. Failures in the underground works will not cause any measurable subsidence at the surface. Continued dispersed residential and other development activities could cumulatively impact cultural resources.

Chapter 4 – Interdisciplinary Review and Standards

4.1 STANDARDS:

4.1.1 STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Environmental analyses of proposed projects on BLM land must address whether the Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions identified in

the applicable Land Health Assessment (LHA).

4.1.2 PLANT AND ANIMAL COMMUNITY (animal) STANDARD:
Since the entire proposed action would occur underground and there would be no surface disturbance, this standard does not apply.

4.1.3 PLANT AND ANIMAL COMMUNITY (plant) STANDARD:
Since the entire proposed action would occur underground and there would be no surface disturbance, this standard does not apply.

4.1.4 SPECIAL STATUS, THREATENED AND ENDANGERED SPECIES (plant) STANDARD:
There are no federally listed threatened or endangered or BLM sensitive species present in the vicinity of the proposed action. This standard does not apply.

4.1.5 SPECIAL STATUS, THREATENED AND ENDANGERED SPECIES (animal) STANDARD:
There are no threatened or endangered animal species or habitats for such species within the proposed coal lease area. This area does provide breeding and nesting habitats for greater sage-grouse and Columbian sharp-tailed grouse. Both species are BLM special status species. Underground coal mines may result in subsidence which could alter surface habitat features slightly. Impacts from subsidence are not likely to have long term negative impacts to either Columbian sharp-tailed grouse or greater sage-grouse populations. This standard is currently being met and is expected to continue to be met in the future.

4.1.6 RIPARIAN SYSTEMS STANDARD:
There is no BLM surface within this project area. This standard does not apply. There is an unnamed drainage on private lands within the project area. It is not known if this drainage contains riparian habitats. Subsidence resulting from underground mining could alter water flow in this drainage.

4.1.7 WATER QUALITY STANDARD:
The water quality standard for healthy public lands will not be affected by the proposed action which occurs on private surface.

4.1.8 UPLAND SOILS STANDARD:
The upland soil standard for healthy public lands will not be affected by the proposed action which occurs on private surface.

4.2 PERSONS/AGENCIES CONSULTED:

Department or Interior, Office of Surface Mining, (OSM)

Colorado Division of Parks and Wildlife, (CPW)

Colorado Division of Reclamation, Mining and Safety, (CDRMS)

Uintah and Ouray Tribal Council, Colorado Native American Commission, Colorado State Historic Preservation Office.

Chapter 5 – References

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Appendix A – Table of Public Comments

Issue	Commentor	Comment	Response
Wildlife	Colorado Parks and Wildlife (CPW)	CPW has statutory responsibility to manage all wildlife species in Colorado. We encourage this project to afford the highest protection for Colorado's wildlife species and habitats in the development of this project. The wildlife issues identified in the Peabody Sage Creek Mine Fish and Wildlife Plan and Peabody Sage Creek Mine permit application comment letter (August 27, 2009) continue to be applicable to the proposed 400 acre lease application. We have appreciated the opportunity to work together with the Peabody Sage Creek Coal Company LLC to benefit wildlife.	Thank you for your comment. Impacts to wildlife are addressed in the EA.
General	Justin Hirsh	I'm here today just to state my opposition to the proposed Sage Creek Coal Mine. I believe this mine poses a threat to our local residents, wildlife and land by essentially destroying habitat and polluting the water supply thereby exposing residents and the environment to increased toxins and heavy metals. Mercury, arsenic, and others are known carcinogens that residents of Northwest Colorado will be unnecessarily exposed to. This mine represents corporate not local interests and most of all I think it represents the past and not the future. Coal is a dirty energy source and it should be phased out in favor of newer cleaner technologies. The main thing I'm concerned about is CO2 emissions that will stem from the mine's over six billion tons of coal. And I believe that this poses an unacceptable risk to global climate change and the health of the local, as well as the global community. Colorado has come a long way in developing its abundant renewable resources such as wind and solar and should continue on this path. And I urge the BLM to strongly consider these facts and utilize this knowledgeto formulate a responsible resource development program that moves us forward into a clean energy future rather than keeping us tied to the destructive dirty energy of the past. Thank you for your consideration.	Thank you for your comment. The EA addresses cumulative impacts on pages 52-58.
Wildlife	Wild Earth Guardians	Cumulative impacts of other coal mining and coal-related activities occurring in the Little Snake Field Office, including mining at the Foidel Creek, Colowyo, and Trapper coal mines, rail traffic, truck traffic, and the Hayden and Craig coal-fired power plants. The EA also appears to fail to consider the connected action of coal exploration at the Sage Creek mine. The Agency is considering a pending coal exploration proposal for the exact same area now pending before the BLM. See 76 Fed. Reg. 55701 (Sept. 8, 2011). Additionally, the Little Snake Field Office is considering other coal leasing and exploration proposals, including the Pinnacle Mains coal lease (0065-EA) and coal exploration	The EA addresses cumulative impacts on pages 52-58. The EA has been amended to include the exploration license in cumulative impacts. Combustion of the coal is too speculative (180 IBLA 135 (2010); 146 IBLA 65, 70 (1998)). "NEPA does not require the BLM to hypothesize as to potential environmental impacts that are too speculative for a meaningful determination of material significance or

Issue	Commentor	Comment	Response
		related to the Trapper coal mine (0092-EA). We are particularly concerned over the cumulative impacts of these activities to air quality, wildlife (in particular sage grouse, Columbian sharp-tailed grouse, and threatened and endangered species such as the Colorado pikeminnow, humpback chub, and razorback sucker), wildlife habitat, and GHG emissions, global warming. The GHG emissions associated with the Craig and Hayden power plants alone amount to more than 14 million metric tons of carbon dioxide ("CO2"), more than 25% of all of Colorado's GHG emissions. Given that both Craig and Hayden burn coal from mines in the Little Snake Field Office, including the Foidel Creek, Trapper and Colowyo mines, the BLM must address such cumulative impacts.	reasonable foreseeability." See climate change section on pages 56-57. The consideration in the determination of the significance of the BLM action is based on the CEQ regulations (40 CFR 1508.27): which requires considerations of both context and intensity: (a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, for a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant. (b) Intensity. This refers to the severity of effect. In evaluating the significance of intensity, Responsible officials must bear in mind that more than one agency may decisions about partial aspects of a major action. The CEQ regulations include ten considerations for evaluating intensity: (1) beneficial and adverse impacts; (2) public health and safety; (3) unique characteristics of the geographic area; (4) controversial nature of the effects; (5) uncertainty or unknown effects; (6) precedential nature of the action; (7) cumulative impacts; (8) connected actions; (9) presence of scientific, cultural, or historical resources; and (10) effect of action on threatened or endangered species and their habitat.

Issue	Commentor	Comment	Response
			The FONSI evaluates the significance of the proposed lease in accordance with CEQ NEPA regulations.
Cumulative Impacts	Wild Earth Guardians	Cumulative impacts related to oil and gas drilling and oil shale development are not addressed. The EA fails to consider the cumulative impacts of oil and gas development and oil shale development in and around the Little Snake Field Office. We are particularly concerned over the cumulative impacts of these activities to air quality, water quality, wildlife and wildlife habitat, GHG emissions and global warming. Although the EA generally identifies actions that may present cumulative impacts (*see* EA at 19), a general list of potential actions is insufficient under NEPA. The BLM must explicitly identify the activities that pose cumulative impacts with the proposed Sage Creek coal lease and analyze and assess those impacts just as the Agency must do with direct and indirect impacts. If the cumulative impacts are significant, then the BLM must prepare an EIS.	The EA addresses cumulative impacts on pages 52-58. The EA addresses Air Resources on pages 15-37. NEPA does not require the BLM to hypothesize as to potential environmental impacts that are too speculative for a meaningful determination of material significance of reasonable foreseeability (180 IBLA 135 (2010). The BLM is not required to consider remote and highly speculative impacts, 146 IBLA 55, 70 (1998). Development of oil and gas and oil shale is speculative; the BLM cannot reasonably foresee the future of oil and gas drilling and oil shale development. Currently, there are no proposals for oil shale development in the area of the LBA.
Indirect Impacts are not addressed	Wild Earth Guardians	The EA notes that this lease will provide coal for the new Sage Creek Mine and that the development of this coal is a "logical consequence" of issuing the proposed coal lease. However, the EA lacks any information about the impacts of that mine, including an identification of the surface facilities and infrastructure that will be needed to support a new mine, as well the associated impacts of these facilities and infrastructure. Although the BLM seems to assert that such impacts are not discernible at this time, the EA discloses that Peabody has very concrete plans in place for the Sage Creek coal mine and may have already received a permit from DRMS for the construction and operation of the new mine. *See* EA at 24. Further, the EA fails to disclose the amount of private and state-owned coal that Peabody will access as a result of the proposed Sage Creek coal lease and the indirect impacts associated with mining that coal. The EA also fails to address the indirect impacts of burning the coal that would	The NEPA process is focused on agency decision making (40 CFR 1500.0(c), 40 CFR 1508.18, 40 CFR 1508.23). The BLM is not required to include a non-Federal connected action together with a BLM proposed action as aspects of a broader proposal, analyzed in a single NEPA document. Proposals are limited to Federal actions (40 CFR 1508.23). At a minimum, it must be demonstrated that the non-Federal connected action was considered in the NEPA document for the proposed action (40 CFR 1508.25). Include the extent to which the

Issue	Commentor	Comment	Response
		be mined, including the air quality impacts, the waste impacts, and water quality impacts, all of which are reasonably foreseeable. Indeed, the EA indicates that the Sage Creek mine will gradually replace the Foidel Creek coal mine. *See* EA at 24. Data from the EIA shows that the Foidel Creek coal mine currently fuels, either fully or partially, 15 coal-fired power plants, including six in Colorado: Cherokee, Craig, Hayden, Martin Drake, Ray Nixon, and Valmont. *See* Exhibit O-2, EIA, Fuel Receipts and Costs Data, Excerpts for Foidel Creek Coal Mine (2010). The BLM can easily investigate the air, water, and waste impacts of these and other power plants fueled by the Foidel Creek coal mine in order to reasonably assess the expected indirect impacts of issuing the proposed Sage Creek coal lease. We are particularly troubled at the lack of an analysis of the fact that the Sage Creek coal mine will lead to greatly increased coal production in the Little Snake Field Office. The EA indicates that the proposed Sage Creek Mine will produce "as much as 8 to 12 [million tons per year" of coal. EA at 24. At the high end, that is 50% more than what the Foidel Creek mine has produced in the last three years.	connected action and its effects can be prevented or modified by BLM decision-making on the proposed action (NEPA Handbook H-1790-1, 2008). Information on the Sage Creek Mine is addressed in the cumulative impacts section, pages 52-58. The EA has been amended to include the extent to which the connected action and its effects can be prevented or modified by BLM decision making on the proposed action. NEPA does not require the BLM to hypothesize as to potential environmental impacts that are too speculative for a meaningful determination of material significance of reasonable foreseeability (180 IBLA 135 (2010). The BLM is not required to consider remote and highly speculative impacts, 146 IBLA 55, 70 (1998). The Sage Creek Mine is permitted for a maximum annual production of 2 million tons of coal (PSCM Mine Permit Application 2.05-5). The EA has been amended to this production rate so that the analysis will not be speculative.
Affected Environment Analysis	Wild Earth Guardians	The EA inappropriately defers to state agencies to complete federally required NEPA analyses. Throughout the EA, the BLM defers to state agencies, including the Colorado DRMS and APCD, to complete NEPA analyses. For example, the EA asserts that DRMS will analyze impacts to sage grouse and sharp-tailed grouse. *See* EA at 11. However, NEPA does not apply to state agencies and there is no indication that these agencies are in any way obligated to analyze and assess the impacts identified by the BLM. We are similarly concerned that the BLM defers to state permitting, such as mining, air, and water permitting, as evidence of no significant impacts. The BLM cannot blindly defer to state permitting processes as evidence of sufficient NEPA analysis and compliance with any substantive requirements, such as Resource Management Plan ("RMP") requirements.	The EA analyzes the effects to sage grouse and sharp-tailed grouse. See Threatened and Endangered Species, p.46-48. The NEPA process is focused on agency decision making (40 CFR 1500.0(c), 40 CFR 1508.18, 40 CFR 1508.23). It is not required to include a non-Federal connected action together with a BLM proposed action as aspects of a broader proposal, analyzed in a single NEPA document. Proposals are limited to Federal actions (40 CFR 1508.23). At a minimum, it must be

Issue	Commentor	Comment	Response
		The BLM must independently analyze and assess impacts, consider a range of alternatives, and adopt mitigation measures to address any potentially significant impacts. State permitting is not a substitute for the BLM's environmental duties.	demonstrated that the non-Federal connected action was considered in the NEPA document for the proposed action (40 CFR 1508.25). Include the extent to which the connected action and its effects can be prevented or modified by BLM decision-making on the proposed action (NEPA Handbook H-1790-1, 2008). The EA has been modified to reflect the extent to which the non-Federal action was considered. The EA analyzes impacts, considers a range of alternatives and identifies mitigation measures to address impacts.
Alternatives	Wild Earth Guardians	The EA inappropriately defers to yet-to-be determined NEPA analyses. The issuance of a coal lease is an irretrievable commitment of resources. Thus, the BLM cannot punt to future analyses, whether or not completed by the state, and fulfill its NEPA obligations. Of primary concern is that by issuing the Sage Creek coal lease, the BLM will foreclose on the ability to consider and adopt reasonable alternatives to address environmental impacts. Because the issuance of a coal lease conveys a right (indeed, a mandate) to develop the coal resource, the BLM cannot rely on future analyses prepared after the issuance of a coal lease as compliance with NEPA.	The EA addresses this comment on pg. : 7 The decision to lease these lands is a necessary prerequisite for mining, but it does not authorize mining. The successful lessee must submit a plan for mining and reclamation to the Secretary of the Interior, Office of Surface Mining (OSM), for review and approval. Once a mining plan has been submitted, OSM will review the developments proposed in the mining plan. OSM will then prepare an additional site-specific environmental assessment or environmental impact statement prior to approval of the mine plan.

Issue	Commentor	Comment	Response
Wildlife	Wild Earth Guardians	The EA fails to actually analyze impacts to sage grouse and sharp-tailed grouse. The BLM does not actually analyze and assess impacts to sage grouse and sharp-tailed grouse. Instead, the BLM both asserts that DRMS will analyze the potential impacts of the new mine and that the company has provided a "Fish and Wildlife Plan" to protect sage and sharp-tail grouse. However, DRMS is not obligated to conduct any NEPA analysis and there is no indication that this state agency will or is capable of analyzing such impacts, and there is no analysis or information presented indicating that any "Fish and Wildlife Plan" will be effective at protecting these grouse species. Notably, the BLM's cousin land management agency, the U.S. Forest Service, requires restrictions on the timing of disturbance near concentrated sharp-tailed and sage grouse breeding sites. According to the 2005 Medicine Bow National Forest Land and Resource Management Plan, new disturbances are prohibited from March 1 through June 30 within 1 mile of breeding sharp-tailed grouse complexes and within 2 miles of sage grouse breeding complex. *See* U.S. Forest Service, Revised Medicine Bow National Forest Land and Resource Management Plan (2005) at 1-40.10 We have attached Chapter 1 of this Land and Resource Management Plan as Exhibit O-3.	The EA analyzes impacts to greater sage grouse and sharp-tailed grouse, see p. 46-48. Cumulative impacts to sage grouse and sharp-tailed grouse are also analyzed in the EA. See p. 58. The decision to lease these lands is a necessary prerequisite for mining, but it does not authorize mining. The successful lessee must submit a plan for mining and reclamation to the Secretary of the Interior, Office of Surface Mining (OSM), for review and approval. Once a mining plan has been submitted, OSM will review the developments proposed in the mining plan. OSM will then prepare an additional site-specific environmental assessment or environmental impact statement prior to approval of the mine plan. Impacts to sage grouse and sharp-tailed grouse will be part of this site-specific analysis. OSM consulted with USFWS on the Sage Creek Mine. The closest lek to the surface facilities of the mine is one mile.
General	Wild Earth Guardians	We request that the BLM either prepare a full environmental impact statement ("EIS") or revise the EA in accordance with the National Environmental Policy Act ("NEPA") to address a number of shortcomings in the analysis that has been presented so far, as well as to address a number of potentially significant impacts. In terms of context and intensity, it appears that the proposed action poses potentially significant direct, indirect, and cumulative impacts to wildlife, lands, air quality, greenhouse gas ("GHG") emissions, and other resources.	The consideration in the determination of the significance of the BLM action is based on the CEQ regulations (40 CFR 1508.27): which requires considerations of both context and intensity: (a) Context. This means that the significance of an action must be analyzed in several contexts

Issue	Commentor	Comment	Response
			such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, for a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant. (b) Intensity. This refers to the severity of effect. In evaluating the significance of Responsible officials must bear in mind that more than one agency may decisions about partial aspects of a major action. The CEQ regulations include ten considerations for evaluating intensity: (1) beneficial and adverse impacts; (2) public health and safety; (3) unique characteristics of the geographic area; (4) controversial nature of the effects; (5) uncertainty or unknown effects; (6) precedential nature of the action; (7) cumulative impacts; (8) connected actions; (9) presence of scientific, cultural, or historical resources; and (10) effect of action on threatened or endangered species and their habitat. The EA was amended to address direct, indirect and cumulative impacts to wildlife, lands, air quality, and greenhouse gas ("GHG") emissions. The EA has been amended to include more information on air resources and greenhouse gas (GHG) emissions. See pages 15-37.

Issue	Commentor	Comment	Response
			The FONSI evaluates the significance of the proposed lease in accordance with CEQ NEPA regulations.
General	Wild Earth Guardians	The BLM has failed to demonstrate that the proposed coal lease is in the public interest. BLM's coal leasing regulations require that an application for a coal lease "shall be rejected in total or in part if the authorized officer determines that…leasing of the lands covered by the application, for environmental or other sufficient reasons, would be contrary to the public interest." 43 CFR 3425.1-8(a)(3). Despite this explicit requirement, nowhere in the draft EA is there any assessment, or any discussion for that matter, as to whether the issuance of the Sage Creek coal lease would be contrary to the public interest.	Based on the analyses of impacts to resources, including positive impacts to socioeconomics, a decision to offer the lands for lease would be in the public interest.

Issue	Commentor	Comment	Response
Endangered Species Act	Wild Earth Guardians	The BLM has failed to comply with the Endangered Species Act. The EA asserts that no threatened or endangered species are in the area. Yet at least four listed species, the bonytail chub, Colorado pikeminnow, razorback sucker, and humpback chub inhabit the Yampa River watershed where the proposed Sage Creek coal lease is located. It is inconceivable that, whether directly, indirectly, or cumulatively, the proposed action will not affect in any way these species, especially given that critical habitat for all four species includes portion of the Yampa River. Fed. Reg. 13374-13400 (March 21, 1994). Thus, it is inconceivable that the BLM is not obligated to consult with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act to ensure the conservation of these species and their habitats. We are particularly concerned that coal mining activities will directly and indirectly contaminate the Yampa River, affecting the species and their habitats. In a recent draft biological opinion for the proposed Desert Rock coal-fired power plant in New Mexico, the U.S. Fish and Wildlife Service found that mercury and selenium emissions from the proposed power plant would jeopardize the continued existence of both the Colorado pikeminnow and razorback sucker, as well as adversely modify their critical habitat. This draft biological opinion is attached as Exhibit O-4, and although it may be a draft, it still represents the best available science that should guide future BLM actions related to the Sage Creek coal lease. In this case, we are very concerned that the Sage Creek coal lease will indirectly lead to mercury and selenium releases due to air emissions, water discharges, and potentially waste discharges from the Craig and Hayden coal-fired power plants, as well as other coal-fired power plants in the region, thereby contributing to contamination in the Yampa River. According to the EPA Toxic Release Inventory data, both the Craig and Hayden power plants release selenium and mercury into the air, water, and through their respective waste streams. *See e.g.* Toxic Release Inventory data for Hayden Power Plant, attached as Exhibit O-5. The BLM must address such indirect impacts to threatened and endangered species and appropriately consult with the U.S. Fish and Wildlife Service over these impacts.	The EA analyzed impacts to threatened and endangered animal species for the proposed action, see p.46-48. There are no threatened or endangered species within the LBA. There would be no impacts to threatened and endangered species of their habitats. See p. 46-48. The BLM cannot speculate where coal from this lease will be used. "BLM is not required to consider remote and highly speculative impacts." (Coeur d'Alene Audubon Society, Inc., 146 IBLA 65, 70 (1998) (citing Trout Unlimited v. Morton, 509 F.2d at 1283).

Issue	Commentor	Comment	Response
NEPA Compliance	Wild Earth Guardians	The EA fails to comply with NEPA. NEPA is the "basic national charter for protection of the environment[,]" and the "centerpiece of environmental regulation in the United States." When BLM issues an EA, it must take a "hard look" at the environmental impacts of the project and the information relevant to its decision. In taking the required "hard look," an EA must "study, develop, and describe" reasonable alternatives to the proposed federal action. This alternatives analysis "is at the heart of the NEPA process, and is 'operative even if the agency finds no significant environmental impact.'" Accordingly, "[i]nformed and meaningful consideration of alternatives" is "an integral part of [NEPA's] statutory scheme." When an agency prepares an EA, "all reasonable alternatives" must be considered and an alternative is generally "reasonable" if it advances the purpose of the proposed project. When BLM considers all reasonable alternatives, it "ensures that it has considered all possible approaches to, and potential environmental impacts of, a particular project; as a result, NEPA ensures that the 'most intelligent, optimally beneficial decision will ultimately be made.'". When eliminating an alternative from consideration in an EA, an agency must provide an "appropriate" explanation "as to why an alternative was eliminated." Further, BLM cannot predetermine or prejudge the result of its environmental analysis in an EA. The Tenth Circuit has explained that "the comprehensive 'hard look' mandated by Congress and required by [NEPA] must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made." Similarly, CEQ's NEPA regulations state that NEPA documents shall not "justify[] decisions already made" and "will not be used to rationalize or justify decisions already made." In this case, the BLM further failed to adequately analyze a number of potentially significant impacts and failed to consider a range of reasonable alternatives to address certain potentially significant environmental impacts. Overall, it does appear that BLM has prejudged the outcome in this case and has simply cobbled together a cursory analysis in order to support its commitment to coal mining.	The EA evaluated a reasonable range of alternatives. See p 11-13. See the Proposed Action, p 11. Through the public scoping process BLM identified a variety of issues to be addressed in the range of alternatives, including issues and approaches from the commenter's submission. The alternatives in the Draft EA were developed to present a reasonable range of alternatives that best addressed the issues, concerns, and approaches identified by the public, while complying with the FLPMA mandate to manage public lands on the basis of multiple use and sustained yield. FLPMA makes it clear that the term "multiple use" means that not every use is appropriate for every acre of public land and that the Secretary can "make the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use…"

Issue	Commentor	Comment	Response
GHG	Wild Earth Guardians	The EA Fails To Sufficiently Analyze Reasonable Alternatives. Despite the substantial GHG emissions resulting from the Sage Creek coal lease, BLM did not analyze in detail any alternative in the EA that would reduce the project's greenhouse gas emissions. Instead, under the proposed action, Sage Creek will almost certainly emit methane directly into the air, without any controls and without any real mitigation. Yet several practicaland effective control technologies and mitigation measures exist to reduce the proposed mine's methane emissions, such as methane flaring, methane capture, combustion of ventilation air methane (VAM), and carbon offsets. None of these alternatives would hinder the project's purpose of allowing Peabody to develop the federal coal resources while giving due consideration to the protection of other resource values. Consequently, BLM should have thoroughly analyzed these controls and mitigation measures as alternatives in the EA. After all, Secretary Salazar has declared that the Department of the Interior "is responsible for helping protect the nation from the impacts of climate change." Consequently, BLM did not adequately consider "a substantial environmental question of material significance to the proposed action," thus violating NEPA. Indeed, the extent of the potential impacts from methane emissions is not clear as the EA fails to disclose even generally what those emissions might be. Citing a lack of "specific information regarding the potential construction and operations" of the proposed mine, the EA finds that it is "not possible to estimate the quantities of greenhouse gases that may be emitted as a result of the coal mine operations." This claim is made despite the fact that the total amount of coal to be extracted is known (3.2 million tons), that the general composition of the coal is known (low-sulfur compliant bituminous coal), and that an adjacent underground coal mine is currently operating (Foidel Creek Mine). Although natural variations are expected to occur and operational factors will play a role, there is clearly enough information available for BLM to present at least a range of methane emission figures – as well as figures related to the likely emissions from mine operations and equipment – to allow for a proper framing of the discussion of potential impacts. BLM must include such information if the costs of obtaining it are not exorbitant, or explain why it cannot. See 40 C.F.R. 1502.22. The mere fact that Peabody is proposing to lease this tract means that Peabody has some idea how its mine will be configured; what coal seam will be mined; and the general character of the methane likely to be found there,	The BLM evaluated a reasonable range of alternatives in its EA see p. 11-13. See Cumulative Impacts Summary p. 52-28. The EA has been amended to include a robust discussion of why certain alternatives were considered, but not carried forward for analysis, including methane capture and methane flaring. See p. 11-13. The EA also includes a discussion of GHG impacts and emissions. See p. 15-37. BLM policy provides requirements to minimize air quality impacts, and to comply with federal, state, and local regulations. The Federal Government has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment, and these have been accepted by the State of Colorado to comply with the Clean Air Act." While actions on BLM lands or lands administered by BLM must comply with these standards, BLM is not the agency responsible for monitoring air quality. BLM works with other federal and state agencies to monitor air quality impacts.

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		and some idea as to the "construction and operation" of the mine in which it is proposing to invest tens of millions of dollars. Further, the EA admits that over a year ago Peabody received a permit to operate the Sage Creek Mine. ("A [DRMS] permit to conduct underground mining at the Sage Creek Mine was issued August 20, 2010"). Peabody has already submitted thousands, if not tens of thousands, of pages of documents describing its mine to the state agency regulating coal mining. In the past, agencies and coal companies have alleged perceived regulatory or safety obstacles, or a lack of technology at the commercial scale, to dismiss considering in detail alternatives to venting and wasting methane. These obstacles are not only exaggerated, but reflect a failure of the agency to rigorously explore and objectively evaluate alternatives to wasting methane. Indeed, methane capture and flaring and other techniques are proven and in use in many parts of the United States and the world (there are more than 220 coal mine methane projects worldwide in 14 countries, according to the World Coal Association). Further, BLM has broad authority to condition coal leases to protect surface resources, which are impacted and will continued to be impacted by climate change. BLM's ability to impose conditions on the development of federal coal is at its greatest when the coal is leased, because the Department has broad authority then to condition the lease. The Mineral Leasing Act states that "[t]he Secretary of the Interior is authorized to prescribe necessary and proper rules and regulations and to do any and all things necessary to carry out and accomplish the purposes of [the Act]." Any NEPA document's failure to consider alternatives that would reduce or offset methane emissions—alternatives which other mines and countries are adopting—would not only violate NEPA but represent a huge missed opportunity. BLM has the opportunity to spur innovation and take a leadership role in addressing climate change. The Secretary of the Interior has urged his Department to do so, stating that DOI is "taking the lead in protecting our country's water, land, fish and wildlife . . . from the dramatic effects of climate change that are already occurring." Secretary Salazar has recognized the importance of DOI's duty to combat climate change, declaring that DOI "is responsible for helping protect the nation from the impacts of climate change." Here, BLM must not take a passive "wait and see" approach on climate change while other countries move forward. Instead, the agencies must consider the measures identified below as reasonable alternatives or reasonable mitigation measures. In reviewing a similar coal LBA EA, a BLM Air Quality Specialist recognized that the agency has a duty to consider alternatives to reduce or mitigate the greenhouse gas emissions of coal mining. According to the BLM Air Quality Specialist: "Clearly,	

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		there are very real limitations to the applicability of CMM [coal mine methane] projects. However, they have been successfully demonstrated in many places and we need to fully and honestly explore the possibilities before we claim that we can not require or even allow them at Oxbow." Indeed, the EPA Coalbed Methane Outreach Program (CMOP) recently reported that within the United States in 2008, there were fourteen active underground mines with coal mine methane mitigation projects that recovered and used 37 billion cubic feet of methane. At a CMOP-sponsored conference in Fall 2010, information was presented on active and planned coal mine methane mitigation projects around the world, including in China, Mongolia, and the United States. There is a long and safe history of mitigation through flaring at working coal mines in the United Kingdom, Australia, and elsewhere. Russia has recently launched its first coalbed methane to energy project. Hundreds of coal mine methane reduction projects are planned throughout the world. Major business interests have recognized the potential markets that could flow from coal mine methane mitigation. Mitigation of coal mine methane is clearly a rapidly maturing field. Given BLM's admission that coal mine methane pollution mitigation alternatives "have been successfully demonstrated in many places," and the proven history of viable mitigation projects in the United States, BLM must "fully and honestly explore" any such alternative possibilities in any subsequently prepared NEPA document.	
Alternatives	Wild Earth Guardians	The EA Fails To Analyze In Detail A Reasonable Alternative To Offset The Lease's Greenhouse Gas Emissions. BLM must consider in detail an alternative that would require the winner of the LBA to offset GHG emissions from the lease. As explained in previous comment letters, such an alternative was reasonable. There are numerous precedents and existing mechanisms through which project developers can offset their global warming impacts. California state agencies have, on several occasions, required such offsets as a condition of approving construction of projects that would release significant quantities of greenhouse gases. For example, the State of California and ConocoPhillips entered an agreement in 2007 that required the company to offset greenhouse gas emissions caused by the company's proposed refinery. Similarly, Minnesota law prohibits the construction of certain new coal-fired power plants that would worsen carbon emissions unless, inter alia, "the project proponent demonstrates to the Public Utilities Commission's satisfaction that [the proponent] will offset the new	See Cumulative Impacts, p. 52-58. The GHG emissions were determined to be insignificant. The BLM evaluated a reasonable range of alternatives in its EA see p. 11-13. The EA has been amended to include a robust discussion of why certain alternatives were considered, but not carried forward for analysis, including methane capture and methane flaring. See p. 11-13. The EA also includes a

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		contribution to statewide power sector carbon dioxide emissions with a carbon dioxide reduction project," including "by purchasing carbon dioxide allowances." Other states have similarly embraced the use of carbon offsets. The U.S. EPA has repeatedly urged land management agencies to consider offsets as a way to reduce the global warming impacts of agency actions, including, specifically, impacts of coal mine methane. In a 2007 letter to the Forest Service concerning a proposal to permit methane drainage wells at the West Elk Mine, EPA specifically rejected a Forest Service statement that the alternative of GHG offsets was not reasonable: EPA believes that it is reasonable to consider offset mitigation for the release of methane, as appropriate. Acquiring offsets to counter the greenhouse gas impacts of a particular project is something that thousands of organizations, including private corporation, are doing today. For example, the U.S. Forest Service and National Forest Foundation launched a plan on July 23, 2007 to sell credits to those seeking to offset their greenhouse gas footprint by measuring carbon stored in trees on areas reforested after wildfires, tornados, and other catastrophic events. The asking price for the two pilot projects is $6 per metric ton of carbon dioxide. As EPA suggested, numerous entities exist that permit developers to purchase carbon offsets that are third-party verified. The Carbon Fund and the Climate Action Reserve both permit entities to purchase carbon "credits." In 2009, the total U.S. carbon offset market was worth $74 million, with 19.4 million metric tons of CO2e in traded volumes. The supply of credits in 2009 reached 29 million tons of CO2e. EPA made a similar recent request that the Forest Service consider alternatives that would offset GHG emissions concerning a proposal to log and burn certain forest lands in Colorado. In its letter, EPA recommended that the Forest Service's final NEPA document should "discuss reasonable alternatives and/or potential means to mitigate or offset the GHG emissions from the action. Finally, the coal mining industry has prepared itself to shoulder costs for emitting GHGs. In a letter to BLM addressing the reasonable price of the coal to be mined from the Elk Creek mine in the North Fork Valley, Oxbow Mining President James T. Cooper stated that "costs to account for methane emissions by EPA under a GHG Cap and Trade scenario will also increase the cost to recover this coal resource." While offsets differ from cap and trade, both would effectively put a price on GHG emissions. Despite the fact that BLM has estimated some of the GHG impacts from the project, the fact that offsets have been required by other agencies, the fact that EPA has repeatedly requested that federal land managers consider offsetting the GHG impacts of proposed actions, the fact that numerous mechanisms exist to offset GHG	discussion of GHG impacts and emissions. See p. 15-37. BLM policy provides requirements to minimize air quality impacts, and to comply with federal, state, and local regulations. The Federal Government has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment, and these have been accepted by the State of Colorado to comply with the Clean Air Act." While actions on BLM lands or lands administered by BLM must comply with these standards, BLM is not the agency responsible for monitoring air quality. BLM works with other federal and state agencies to monitor air quality impacts

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		impacts in the U.S., the fact that the coal mining industry understands it might have to pay to mitigate GHG impacts, and despite commenters' past requests that BLM consider an offset alternative on similar projects, BLM failed to analyze a reasonable alternative that would require Peabody to offset some or all of its GHG impacts. BLM's EA does not mention offsets. Nor does it explain why BLM cannot consider offsets as a reasonable alternative. BLM thus failed to "explain its reasoning for eliminating an alternative" from consideration in an EA, as required by NEPA. BLM cannot allege that an alternative that would permit the agency to offer the Sage Creek LBA while requiring offsets would not fulfill the proposed action's purpose and need. Such an alternative would allow Peabody to develop the federal coal resources while giving due consideration to the protection of other resource values. It would simply increase Peabody's cost of doing so while mitigating some of the proposal's damaging impacts. Further, because BLM has failed to evaluate this alternative in any way, it cannot allege that the alternative is not economically feasible. BLM certainly cannot argue that such an alternative is not technically feasible since purchasing carbon offsets is not technically demanding. It simply would require Peabody to quantify the amount of CO2e emissions (in tons) that it would offset, find a reputable vendor or exchange, and pay the appropriate price per ton for verifiable credits. For these reasons, BLM's failure to consider the reasonable alternative of requiring Peabody to purchase carbon credits, and its failure to explain why it dismissed such an alternative, violate NEPA.	
Alternatives	Wild Earth Guardians	The EA Fails To Analyze In Detail Reasonable Alternatives To Reduce The Lease's Greenhouse Gas Emissions By Combusting Ventilation Air Methane. The Sage Creek LBA EA does not describe the methane removal technique that will be employed at the mine. It is possible that all of the methane projected to be released by Sage Creek mine each year will enter the atmosphere through the mine ventilation system. Although more attention has been given to drainage and related methane capture techniques, mitigation alternatives also exist for ventilation air methane ("VAM") and should be considered for the Sage Creek mine. A wealth of data demonstrates that VAM mitigation measures are technically and economically feasible, since such measures have been adopted at coal mines in the United States and around the world. In fact, there is a long history of capturing and/or combusting methane, including VAM. Unlike methane emissions from drainage wells, VAM cannot be flared because the concentrations of methane in ventilation air are too dilute; so other technologies must be used to control VAM emissions. EPA reports that technology is available	The BLM evaluated a reasonable range of alternatives in its EA see p. 11-13. See Cumulative Impacts, p. 52-58. See Amended Air Resources, p. 15-37. The GHG emissions were determined to be insignificant. The EA has been amended to include a robust discussion of why certain alternatives were considered, but not carried forward for analysis, including methane capture and methane flaring. See p. 6-8.

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		and in use to harness VAM. These technologies permit coal mines to combust VAM even at very low concentrations. This combustion has been shown to destroy 95% or greater of VAM, greatly reducing global warming pollution emitted by a mine. MSHA has approved VAM mitigation projects and has established procedures for continuing to do so. Further, a variety of mechanisms exist to fund and/or partially offset the cost of coal mine methane mitigation systems. EPA's Coalbed Methane Outreach Project has recently identified four U.S. VAM mitigation projects using oxidation that are completed, underway, or planned: • CONSOL Windsor Mine (closed) (MEGTEC vocsidizer) • Jim Walter Resources Mine No. 4 (Biothermica VAMOX) • CONSOL McElroy mine in West Virginia (Durr Ecopure technology) • CONSOL Enlow Fork mine in Pennsylvania The first VAM oxidation demonstration in the United States was carried out by CONSOL Energy at their abandoned Windsor coal mine. This project illustrated that the oxidizer could "reliably convert very low concentrations of methane present in mine ventilation exhaust air to carbon dioxide and water" and determined "the quantity of useful energy that can be produced by the oxidation reaction." The project achieved an efficiency of at least 95%. Jim Walter Resources' No. 4 Mine in Alabama has operated VAM-reduction technologies since March 2009.64 This project has been registered with the U.S. Climate Action Reserve (CAR), which helps fund the project. The Mine Safety and Health Administration (MSHA) approved this project, which has destroyed up to 98% methane and avoided over 42,000 tons of CO2e emissions. The company intends to implement similar projects at "all current and future suitable ventilation shafts at Walter Energy's coal mines," with the first such project to be operational in 2011. Another CONSOL Energy project has been developed to mitigate VAM emissions at an active West Virginia coal mine (CONSOL's McElroy mine in Marshall County). This project is "intended to demonstrate significant reductions in methane emissions, in a safe and proven manner, and without any impact on mine operations or production." A third CONSOL Energy project will reduce VAM emissions by 190,000 tons of CO2e a year at the Enlow Fork Mine in Pennsylvania. This project was scheduled to be operational 2011 and will offer carbon offset credits through the CAR. EPA has compiled a number of other examples of the use or destruction of VAM in coal mines in the United States and around the world. For example, in Australia, one coal mine is using ventilation air to generate power. In 2009, the U.S. and Chinese governments announced that technology developed in the United States to oxidize VAM would be	The EA was amended to include more detailed discussion of GHG impacts and emissions. See p. 15-37. BLM policy provides requirements to minimize air quality impacts, and to comply with federal, state, and local regulations. The Federal Government has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment, and these have been accepted by the State of Colorado to comply with the Clean Air Act." While actions on BLM lands or lands administered by BLM must comply with these standards, BLM is not the agency responsible for monitoring air quality. BLM works with other federal and state agencies to monitor air quality impacts. The BLM evaluated a reasonable range of alternatives in its EA see p. 11-13.

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		used at a coal mine in China. It is "expected to reduce greenhouse gas emissions by up to 200,000 tons of CO2 equivalent per year. The VAM project is expected to . . . commence operations by the end of 2010 . . . . The VAM project will . . . capture [and destroy] about 95 percent of methane within the exhaust stream before it is released into the atmosphere." The United States and China have also agreed to a joint project "to generate electricity from ventilation air methane (VAM) at a Chinese coal mine." At least four more Chinese VAM projects are expected to be operational in the next two years. VAM technologies are sufficiently advanced and in use that EPA has elsewhere urged BLM to consider in NEPA documents "alternatives and/or mitigation measures to reduce the projected methane emissions, including . . . technologies such as oxidation of dilute methane emitted from ventilation shafts." Data from other coal mines in the region suggest that VAM reduction technologies in use in the U.S. and around the world could be technically feasible at this mine. MSHA data from 2008-2009 demonstrate that all of the sampled coal mines in MHSA's District 9 are producing methane in sufficient concentrations to operate a VAM oxidizer. These data show methane concentrations of a minimum of 0.30, while VAM oxidizers are proven to operate reliably at concentrations as low as 0.2%. The EA contains no description of VAM technologies and fails to address an alternative that would require Peabody to adopt VAM reduction. The EA also fails to address the economic or technical feasibility of a VAM reduction alternative, despite the existence of substantial evidence showing such technologies in use in the U.S. and around the world, and the likelihood that such technologies would be effective at the Sage Creek Mine, based on the mine data described above. Nor does the EA provide any basis for rejecting such an alternative, in violation of NEPA. Instead of a "hard look" at the alternative of VAM reduction, BLM took no look at all. BLM must correct this failure in any subsequently prepared NEPA document.	
Alternatives	Wild Earth Guardians	The EA Fails To Analyze In Detail Reasonable Alternatives That Would Require Methane Capture And Use. While methane, or natural gas, is a potent greenhouse gas, it is also a valuable commodity that can be captured, processed, and sold; or captured for use as a fuel to generate electricity or lighting at the mine. As a result, many underground coal mines capture coal mine methane for sale or other uses as a fuel. BLM eliminated a methane capture alternative from detailed analysis in the EA based on the summary statement: The methane capture alternative was eliminated from detailed analysis due to the environmental impacts and the economic infeasibility	The BLM analyzed a reasonable range of alternatives, see p. 11-13. See amended Cumulative Impacts, p.52-58. The GHG emissions were determined to be insignificant. The EA has been amended to include a robust discussion of why certain alternatives were

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		associated with the infrastructure required to capture the methane. The development and implementation of one or more alternative technologies for mitigating the release of methane is economically infeasible and technically difficult. The EA's statements are unfounded. First, BLM has no records of any kind demonstrating that it or anyone else has reviewed the costs and benefits of any alternative or mitigation measure to limit or offset methane from the Mine. Through the Freedom of Information Act, WildEarth Guardians sought any records BLM might have supporting the EA's statement that: "The development and implementation of one or more alternative technologies for mitigating the release of methane is economically infeasible and technically difficult." BLM's response, sent to Earthjustice on September 14, 2011, provided no documents that addressed either the costs or the technical difficulty of implementing any methane mitigation alternative. The EA's statement is thus without any basis, and arbitrary and capricious. As no meaningful information is provided in the EA, we are forced to look to regional trends for this analysis. As with carbon offsets, a VAM reduction alternative would fit the project's purpose and need because it would still allow Peabody to recover and make beneficial use of the coal resources. Second, a review of the literature on methane capture, however, clearly demonstrates that methane capture as an alternative does not merit dismissal without a detailed analysis. The United Nations notes that methane capture at mines for on-site lighting dates back to the 1800s, and "[s]ince the 1960s, increasing use has been made of drained gas, initially for mine boilers and industrial processes and then later for power generation, pipeline gas, and town gas." A recent United Nations report on methane capture and flaring provides case studies of methane capture from around the world, including methane capture systems at longwall operations, the mining technique proposed for use at the Sage Creek Mine. EPA is actively engaged in efforts to reduce methane emissions from coal mines— including participation in the international Global Methane Initiative, which is designed, in part, to expand the use of methane capture projects at coal mines. EPA's Coalbed Methane Outreach Program reports that as of 2008, fourteen active underground mines employed methane capture systems that captured a total of 37 billion cubic feet of methane. When EPA commented on an EIS to expand the West Elk Mine in the North Fork Valley, it criticized the Forest Service's failure to include methane capture as an alternative in the EIS, explaining that "[m]ethane capture and reuse is a reasonable alternative to the proposal of venting the methane to the atmosphere, and thus, we recommend that it be analyzed." Methane capture is feasible, effective,	considered, but not carried forward for analysis, including methane capture and methane flaring. See p. 6-8. The amended EA includes a discussion of GHG impacts and emissions. See p. 15-37. BLM policy provides requirements to minimize air quality impacts, and to comply with federal, state, and local regulations. The Federal Government has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment, and these have been accepted by the State of Colorado to comply with the Clean Air Act." While actions on BLM lands or lands administered by BLM must comply with these standards, BLM is not the agency responsible for monitoring air quality. BLM works with other federal and state agencies to monitor air quality impacts

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		practical, and available; but BLM summarily concluded that methane capture would be unreasonable at the Sage Creek Mine based on two rationales. First, BLM alleges that methane capture would result in unacceptable "environmental impacts" associated with the infrastructure necessary to capture methane. Second, BLM states that methane capture suffers from "economic infeasibility." BLM's conclusions, however, are arbitrary. **a. BLM Lacks Support for Its Conclusion That Methane Capture Would Cause Increased Environmental Impacts.** BLM fails to provide any details on what potential environmental impacts would result from methane capture alternatives. If BLM had access to any information to inform an analysis it has not provided any of this information to the public. Consequently, there is no opportunity for public discussion or public oversight of the information provided by the project proponent, which apparently forms the basis for BLM's conclusory statements in the EA. Withholding information from the public that is necessary to make an informed comparison of alternatives violates NEPA. Moreover, the EA does not attempt to balance or weigh any purported impacts against the environmental benefits resulting from methane capture, which is the very purpose of the EA. **b. BLM Lacks Support for Its Conclusion That Methane Capture Is "Economically Infeasible."** BLM's conclusion that methane capture alternatives are "economically infeasible" (or suffers from "economic infeasibility") is not supported by the record. First, while BLM concludes methane capture is "economically infeasible," BLM nowhere defines or explains what constitutes "economic feasibility." The fact that methane capture might not be profitable by itself, as a stand alone project, should not mean that it is economically infeasible—a methane capture system that breaks even or results in a loss when considered in isolation may be economically feasible when viewed in light of the overall LBA. (After all, mitigation measures almost always cost money, but if required, the cost of mitigation is no reason for an applicant not to implement them.) Without such a definition, BLM cannot rationally conclude that methane capture is not economically feasible. Second, the EA contains absolutely no data, nor any analysis of the actual costs (or economic benefits) of installing a methane capture system at Sage Creek. At no point does the EA address the multiple examples in the United States and throughout the world where methane capture has been successfully employed. BLM fails to even point to a single example where methane capture has been attempted, tested, or even considered, let alone found to be uneconomic. A NEPA	

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		analysis that ignores the many examples of successful methane capture across the United States and the world, presenting no data to support a decision to exclude a detailed analysis of methane capture as an alternative, would be arbitrary and capricious. While methane capture may cost money, there can be no doubt that capture can be economically performed, since it is ongoing at numerous mines in the U.S. and around the world. Walter Energy (parent company of Jim Walter Resources) has been capturing coal mine methane from its Alabama mines since 1979 through its Black Warrior Methane subsidiary. These facilities capture methane from gob wells. In Pennsylvania, RAG American Coal Co. in 2003 received approval to capture and process methane. A 2007 EPA presentation documents 10 capture and utilization projects at active mines in the United States, including: natural gas pipeline injection, mine air heating, and coal drying. 90 This document also reports that technology is available to harness ventilation air methane, which typically occurs at concentrations of less than 1%. In addition to those projects in the U.S., numerous projects around the globe capture and utilize methane, including: "natural gas pipeline injection, electric power production, co-firing in boilers, district heating, mine heating, coal drying, vehicle fuel, flaring, and manufacturing/industrial uses[.]" In fact, EPA is making grants and providing technical workshops to promote responsible use of coal mine methane in other countries. BLM should consider various capture and use alternatives, including: (1) capturing methane and sending it to market via a pipeline; and (2) burning the methane on-site and generating electricity. There is ample evidence that at least one major American corporation – Caterpillar – is building scores of engines that turn coal mine methane at working mines into power around the world, including in China. General Electric is also building engines used to generate power from working mines in China and Australia. Given how easy it will be for the agencies to contact these large American corporations, BLM can address an alternative that uses this technology to capture and use methane. The purpose of NEPA is to foster public disclosure and public discussion of a project's environmental impacts, including reasonable alternatives. As the Tenth Circuit has explained, "[a]t all stages throughout the [NEPA] process, the public must be informed." NEPA "facilitates informed decision making by agencies and allows the political process to check those decisions," by "focusing both agency and public attention on the environmental effects of proposed actions." A NEPA document violates the statute if "it fails to provide policymakers	

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		and the public with sufficient information to 'make an informed comparison of the alternatives.'" BLM violates NEPA when, as here, it fails to publically disclose the basis for its analysis and its decision refusing to consider an alternative. viewed September 14, 2011, (Caterpillar will supply "60 methane-gas-powered generator sets to produce 120 megawatts of power at the Sihe Coal Mine in Jincheng City, Shanxi Province, China," and stating that "The power plant project is expected to improve methane gas ventilation at the mine site, improving safety while providing an environmentally friendly fuel source to generate electricity. Historically, the methane has been vented into the atmosphere, generating greenhouse gas emissions. By capturing the previously vented methane gas and converting it into electricity, the Caterpillar generator sets will significantly reduce greenhouse gas emissions while also improving the capacity of the local power grid". **4. The EA Fails To Analyze In Detail Reasonable Alternatives That** **Would Require Methane Flaring.** In addition to methane capture, coal mine methane can be combusted, or flared, before it enters the atmosphere. Flaring results in between 75% fewer GHG emissions than direct methane venting into the atmosphere. As with methane capture, methane flaring is a reasonable, practical, effective, and feasible alternative to reduce the greenhouse gas emissions of the Sage Creek mine. There is a long and safe history of flaring at working coal mines. Active mine flaring has been conducted in at least the following working coal mines: the United Colliery mine in Australia, and in at least six UK Coal collieries. In the United States, a coal mine in Wyoming has put in place a system that is functionally equivalent to flaring (on-site incineration). MSHA's approval was apparently not required for this mitigation measure. It is unclear what obstacles to on-site incineration were overcome in Wyoming that cannot be overcome in Colorado. At a conference sponsored by EPA in St. Louis in September 2007, evidence was presented that methane flaring at working coal mines was "state of the art," and that flaring to dispose of vented methane at coal mines was "[s]imple, low cost and reliable to operate" with "[l]ow maintenance requirements." In April 2008, one industry expert noted that "[o]ff the shelf systems are available from companies that provide Flaring systems that are designed for and are in use around the world over coal mines." EPA has noted that flaring is standard safety practice in many industries, and that "outside of the United States, methane flaring at underground coal mines is widely accepted and approved as a safe practice." EPA has	

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		repeatedly urged BLM to consider the alternative of flaring in NEPA documents evaluating coal mine expansions in Colorado. Mr. Erik Sherer, Mining Engineer at MSHA's Division of Safety, stated in 2007 that because flaring was safe, MSHA would approve it at a working coal mine under certain conditions. There is a long and safe history of flaring waste gases and volatile hydrocarbons in the petroleum and chemical industries. MSHA would approve flaring of methane drainage [at West Elk] if appropriate protections are incorporated into the flaring system. EPA has also concluded flaring methane at active mines is safe and practical. EPA based its conclusion in part on the agency's own 1999 conceptual design of a flare system whose specific purpose is to combust coal mine methane. EPA's design "incorporates applicable petroleum industry codes and guidelines to achieve stringent industry safety requirements." MSHA's Mr. Sherer told the Forest Service in 2007 that his agency had reviewed and endorsed EPA's flare design: MSHA has reviewed the EPA flare system and concurs that this is an acceptable method for flaring methane produced from coal mine degas holes. However, any proposed flare system would have to be designed for mine-specific conditions (flow rates, gas concentrations, etc.) and must be approved in the ventilation plan. Based on such evidence, EPA concluded that flaring methane was a "viable alternative" for addressing methane released from coal mines. Despite the evidence showing flaring to be both practical and effective, BLM dismissed from detailed consideration a methane flaring alternative in three sentences, based on two arguments. First, BLM argues that because a flaring system would have to be approved by MSHA, completion of this approval process could take time. Second, BLM stated that methane flaring "would result in the release of other air pollutants, including nitrogen oxides, carbon dioxide, and carbon monoxide." Neither of these reasons provides a rational basis for dismissing flaring. **a. The Time Required For Approval Is Not A Reasonable Basis For Dismissing Flaring.** Despite the multitude of examples of successful methane flaring from similar coal mines, BLM eliminated methane flaring from detailed analysis in the EA in part because "it is not likely that a thorough review and approval [by MSHA] would occur prior to the development and operation of the mine expansion." There are two problems with this argument. First, BLM provides no information concerning: (1) how long MSHA	

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		approval might take; or (2) when Sage Creek wants to mine the coal at issue. BLM does not state that it has attempted to contact MSHA to determine how long a "thorough review" by that agency might take. Nor does BLM state how many months or years it may be before Peabody wishes to mine the proposed lease. If MSHA approval may take a year, and Peabody is not likely to mine the proposed lease for three, there is no reason why BLM's NEPA review must be completed now. BLM could wait until a flaring proposal is reviewed and approved. Second, the fact that methane flaring would not be immediately approved by the MSHA does not excuse BLM from considering methane flaring as a reasonable alternative in its NEPA analysis. An agency may not predetermine or prejudge the outcome of its environmental analysis because the project proponent prefers to begin operations before the leasing and permitting process will be completed. An otherwise reasonable alternative is not transformed into an unreasonable alternative simply because the approval and permitting process would take time. Moreover, in a May 2010 letter to BLM, MSHA made clear that there were no regulatory obstacles to the agency approving methane flaring. MSHA explained: The [MSHA] has looked into the issue of flaring methane gas that is captured at underground coal mines. As you know mines throughout the country have been practicing methane drainage through strategically placed drainage wells, drilled from the surface, for many years. . . . A review of our regulations indicate that there is no specific prohibition [on] flaring gas, and as such, the Agency would consider any mine operators plan to flare gas at their location. . . . [T]here is considerable latitude given in the regulations which speak to mine ventilation and control of methane. . . . Flaring of methane that is removed from the mine through wells could be included in the ventilation plan and the plan would be subject to review prior to approval. Since flaring has not been done on active mine gobs in the past in this MSHA district, a plan to flare would have to be reviewed by MSHA's Technical Support group to ensure it adequately addresses all the necessary precautions to ensure safety of all persons in the mine. There is no specific obstacle to accomplishing this, but a thorough review of the first flaring plan would be necessary to establish what the requirements for such a system would be. Furthermore, failure to involve MSHA in the process in a timely fashion should not be allowed to make this a crisis. If MHSA input was necessary to	

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		complete the required NEPA analysis in a competent manner, then that input should have been sought early in the process. BLM cannot delay and then exclude reasonable alternatives from consideration in its NEPA analysis because there would not be sufficient time to review and approve the alternatives.120 **b. The Potential Air Pollution Impacts From Flaring Are Not A Reasonable Basis For Dismissing Flaring.** BLM also dismissed methane flaring as a reasonable alternative with a one sentence statement that "flaring of methane would result in the release of other air pollutants, including nitrogen oxides, carbon dioxide, and carbon monoxide." This conclusory statement does not justify the elimination of an otherwise reasonable alternative. The EA provides no details on the scope of nitrogen oxide (NOx), carbon monoxide (CO), and CO2 emissions resulting from methane flaring, nor are we aware of any evidence or studies in the record concerning the amount of such pollutants (if any) flaring might cause. In contrast, BLM and the public know that flaring would reduce and mitigate methane emissions from the mine, which would have important climate benefits. Without information concerning the level of other air pollutants, it is impossible for the agency or the public to weigh the climate benefits of methane flaring against flaring's potential air pollution impacts. BLM's failure to provide or investigate such information undermines the very purpose of NEPA. In addition, any suggestion that methane flaring is unreasonable because of NOx, CO, and CO2 emissions is wholly undermined by the fact that EPA—the federal agency responsible for regulating NOx, CO, and greenhouse gas emissions—has an entire program dedicated to reducing coal mine methane emissions through methane flaring and methane capture. As noted above, EPA designed, publicized, and promoted a flaring system because of the damaging impacts of methane pollution, notwithstanding other pollutants flaring might cause. It is also puzzling that BLM would dismiss without detailed analysis a flaring alternative when the agency allows flaring of natural gas from oil and gas wells during initial production tests, among other circumstances. In sum, methane flaring is a reasonable, practical, effective, and feasible alternative that accomplishes the purpose of the project, while reducing greenhouse gas emissions. Consequently, BLM's conclusory dismissal of a methane flaring alternative based on no evidence and an arbitrary	

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		timeline is unlawful. Any subsequently prepared NEPA document should analyze methane flaring in detail as an alternative to the proposed action. **B. The EA Fails to Include a Reasonably Complete Discussion of Mitigation Measures** NEPA requires agencies to provide a detailed statement of "any adverse environmental effects which cannot be avoided should the proposal be implemented." For these unavoidable impacts, NEPA requires a discussion of appropriate mitigation measures. The Ninth Circuit has explained that this mitigation discussion is required "precisely for the purpose of evaluating whether anticipated environmental impacts can be avoided." If "all practicable means to avoid or minimize environmental harm from the alternative selected" have not been adopted, the agency's record of decision must explain "why they were not." The CEQ has stated: "All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperation agencies . . . ." According to the CEQ, "[a]ny such measures that are adopted must be explained and committed in the ROD." The Tenth Circuit has held that an agency's analysis of mitigation measures "must be 'reasonably complete' in order to 'properly evaluate the severity of the adverse effects' of a proposed project prior to making a final decision." Mitigation "must be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated." According to the U.S. Supreme Court, "[O]mission of a reasonably complete discussion of possible mitigation measures would undermine the 'action-forcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." A "perfunctory description," of mitigation, without "supporting analytical data" analyzing their efficacy, is inadequate to satisfy NEPA's requirements that an agency take a "hard look" at possible mitigating measures. An agency's "broad generalizations and vague references to mitigation measures . . . do not constitute the detail as to mitigation measures that would be undertaken, and their effectiveness, that the Forest Service is required to provide." In addition to constituting reasonable alternatives, carbon offsets, elimination of VAM, methane capture, and methane flaring are all practicable mitigation measures that should have been analyzed in the EA. In fact, the CEQ has singled out methane venting from coal mines— the very activity at issue here—as warranting a mitigation discussion under NEPA: "Examples of proposals	MSHA would not approve flaring without significant preliminary testing to assure safety; therefore flaring would not be a feasible alternative. (Civil Action No. 08-cv-02167-MSK)

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		for Federal agency action that may warrant a discussion of the GHG impacts of various alternatives, as well as possible measures to mitigate climate change impacts include . . . authorization of a methane venting coal mine." As discussed above, BLM dismissed analyzing methane capture and methane flaring in any detail, and failed to consider at all carbon offsets and elimination of VAM. Consequently, BLM approved the lease without an adequate discussion of whether its greenhouse gas impacts could be avoided. The failure of the draft EA to consider mitigation violates the requirement in NEPA that an agency discuss mitigation measures in an EA or EIS to "evaluat[e] whether anticipated environmental impacts can be avoided." Moreover, as discussed above, BLM failed to rationally explain why "practicable means to avoid or minimize environmental harm from the alternative selected" were not adopted. See 40 C.F.R. § 1505.2(c). Ample evidence exists that methane capture, methane flaring, and carbon offsets are practicable and effective measures to reduce or avoid the project's greenhouse gas emissions and impacts. Consequently, these mitigation measures must be discussed in detail in any subsequently prepared NEPA document. **C. The EA Fails to Adequately Analyze and Assess Air Quality Impacts** The draft EA fails to analyze and assess impacts to a number of air quality standards, despite the fact that BLM acknowledges that development of the Sage Creek coal lease will release a number of harmful air pollutants. The EA discloses that a number of activities will release air pollution, but makes no effort to quantify the emissions or analyze the extent to which these emissions will ensure adequate protection of air quality standards and other air quality related values. This is a significant oversight. Not only does NEPA require BLM to take a hard look at environmental impacts, including air quality impacts, but the Federal Land Policy and Management Act ("FLPMA") explicitly requires the Agency to protect federal air quality standards. *See* 43 U.S.C. § 1712(c)(8). The EA's failure to adequately analyze and assess air quality impacts violates NEPA as well as FLPMA. Making matters worse is that the EA appears to rely entirely on a yet-to-be completed APCD permitting process as evidence of sufficient analysis of impacts and protection of air quality. This reliance is misplaced. Although the State of Colorado may regulate air quality, FLPMA clearly imposes an independent duty upon the BLM to address air quality impacts as well. Furthermore, to the extent the APCD permits stationary sources, such permitting does not extent	

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		to mobile sources, such as locomotives and mine traffic. Furthermore, APCD is under no obligation to analyze and address cumulative air quality impacts or otherwise complete an analysis in accordance with NEPA. Our further concerns over air quality impacts are as follows: **1. The EA Fails to Analyze the Impacts to Ambient Ozone Concentrations.** The EA fails to analyze and assess impacts to ambient concentrations of ozone air pollution. Ozone is a pollutant of concern for which the Clean Air Act has established National Ambient Air Quality Standards (NAAQS). Ozone is formed when two key air pollutants—volatile organic compounds (VOCs) and nitrogen oxides (NOx)—react with sunlight. Nevertheless, BLM entirely fails to analyze the impacts to ambient concentrations of ozone—including impacts from construction and production operations. BLM's failure to analyze and assess at all impacts to ambient ozone concentrations is troublesome in light of increasing ozone trends in the Rocky Mountain West, including western Colorado, and the link between rising ozone and industrial development and associated increases in VOC and NOx emissions. For example, a large region in western Wyoming has been declared a "nonattainment" area because the region violated the ozone NAAQS in 2008. While the NAAQS limit ozone concentrations to no more than 0.075 parts per million (ppm) over an eight hour period, ozone concentrations reached 0.122 ppm in parts of western Wyoming in 2008, higher than most urban areas. As Wyoming Governor Freudenthal noted in a letter to Acting EPA Region 8 Administrator Carol Rushin, these high ozone concentrations are linked to increasing natural gas drilling and production in the region. Recent modeling prepared for the Western Regional Air Partnership (WRAP) confirms that large areas of the Rocky Mountain West, in particular much of Colorado, are projected to exceed and/or violate the ozone NAAQS by 2018. In a 2008 presentation given at a WRAP Technical Analysis Meeting in Denver, it was reported that the modeling "predicts exceedance of the 8-hour average ozone standard in much of the southwestern U.S., mostly in spring." The image below, presented at the WRAP Technical Analysis Meeting, shows areas projected to exceed and/or violate the current ozone NAAQS by 2018 in orange and red. (**BLM note: map not included)**. In addition, findings of recent scientific studies show that ozone in the Western United States is uniquely influenced by atypical factors. For instance, the National Oceanic and	

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		Atmospheric Administration (NOAA) recently completed a study finding that ozone air pollution can be problematic in winter in the Rocky Mountain West. After studying the phenomenon in Western Colorado, NOAA stated in a press release: The NOAA team found ozone was rapidly produced on frigid February days in 2008 when three factors converged: ozone-forming chemicals from the natural gas field, a strong temperature inversion that trapped the chemicals close to the ground, and extensive snow cover, which provided enough reflected sunlight to jump-start the needed chemical reactions. NOAA reported, "the problem could be more widespread," explaining: "Rapid production of wintertime ozone is probably occurring in other regions of the western United States, in Canada, and around the world." A 2008 Colorado Air Pollution Control Division analysis suggests that many areas of western Colorado could be susceptible to high wintertime ozone levels given the propensity for winter-time inversions and other conditions that favor ozone formation. The issue of wintertime ozone may be linked to coal mining, among other activities. The *Denver Post* reported in 2009: Since the initial [NOAA] findings were published January in the journal Nature GeoScience, there have been more incidents. Elevated ozone levels have been detected in eastern Wyoming in the Thunder Basin, where there is no oil and gas drilling, [NOAA researcher] Schnell said. But there are coal mines and the ozone may be linked to methane and the diesel fumes from large earth-moving machines, Schnell said. There is also increasing evidence that global warming is affecting ambient ozone concentrations. As the United Nations Environmental Programme (UNEP) notes, global warming is an increasingly significant factor "promot[ing] the formation of surface ozone." One of the principle effects of global warming is an increase in the "frequency and intensity of heat waves." As a result of the tendency of global warming to produce longer and hotter summer peak temperatures, the IPCC projects increases in July mean ozone concentrations over the industrialized continents of the northern hemisphere will climb above 0.07 ppm by the year 2100. A 2007 study by scientists at Harvard, NASA, and the Argonne National Laboratory specifically reported that global warming is likely to increase maximum eight-hour ozone concentrations by 2-5 parts per billion (0.002-0.005 ppm) over large swaths of the United States, impacts of climate change on ozone concentrations is anticipated to be uneven from region to region, climate change is expected to cause increases in summertime ozone concentrations over substantial regions of the country.150 Additional research estimated that the area affected by elevated ozone within the continental United States was	See amended Air Resources, p 15-37.

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		projected to increase (38% in areas with levels exceeding the 0.075 ppb ozone standard at least once a year), and that the length of the ozone season was projected to increase. This evidence demonstrates that ozone is a significant issue, and that BLM should have analyzed and disclosed the impacts of the Sage Creek coal lease on ozone levels in areas impacted by the mine's emissions. Bolstering this conclusion, EPA has noted the need for federal land management agencies to address impacts to ambient ozone concentrations. In comments to BLM regarding expansion of oil and gas drilling and production operations in the Pinedale Anticline Project Area of Wyoming, EPA commended BLM for "using the photochemical grid model, CAMx" in analyzing ozone impacts and noted: "This level of analysis is particularly important given the elevated ozone levels that have been recorded at ambient air monitoring stations neighboring the [project area]." Similarly, in comments to the BLM regarding the West Tavaputs Plateau natural gas development project in Utah, EPA stated that "additional cumulative and project-specific air impact modeling should be completed" to address ozone impacts. BLM itself undertook a rudimentary ozone analysis for the coal lease for the proposed, nearby Red Cliff Mine in Colorado, estimating NOx and VOC emissions caused by mine construction as well as mine operation. Furthermore, state regulations will not ensure that Sage Creek coal mine will not cause or contribute to exceedances and/or violations of the ozone NAAQS. First, state regulations will not address any mobile source emissions, particularly exhaust emissions, that could cause or contribute to ozone exceedances and/or violations. At Sage Creek, those emissions—from trucks, rail transport, and other heavy equipment such as loaders—could be considerable. Second, the air permits issued by CDPHE for the existing Foidel Creek do not even limit VOC emissions. Third, CDPHE does not analyze the impacts of permitting stationary sources to ambient ozone levels. CDPHE has explicitly stated that, "ozone modeling is not routinely requested for construction permits." BLM was required to take a "hard look" at the potential impacts on ozone creation caused by the project given growing concern over ozone in the Rocky Mountain West; the fact that BLM has analyzed ozone impacts elsewhere in the region; and that state and federal regulations, including permitting requirements, fall short of ensuring full protection of the ozone NAAQS. BLM cannot ensure that the Sage Creek coal lease will comply with the ozone NAAQS, both the current and the proposed, without first preparing a quantitative analysis of impacts. For all of these reasons, the EA fails to take the required "hard look" at the impacts of the Sage Creek coal lease to ambient ozone concentrations. BLM must cure these defects in any	

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		subsequently prepared NEPA document. **2. The EA Fails to Analyze Impacts to PM2.5 Concentrations.** The EA also fails to analyze impacts to concentrations of PM2.5, a harmful air pollutant. PM2.5 includes all particles less than 2.5 microns in diameter, or 1/28th the width of a human hair. According to EPA, the health effects of PM2.5 include: • Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; • Decreased lung function; • Aggravated asthma; • Development of chronic bronchitis; • Irregular heartbeat; • Nonfatal heart attacks; and • Premature death. Although the NAAQS limited PM2.5 concentrations to no more than 35 micrograms/cubic meter over a 24-hour period and 15 micrograms/cubic meter annually, the D.C. Circuit overturned these standards in 2009 on the basis that EPA failed to demonstrate that the standards sufficiently protected public health.156 EPA's own Clean Air Scientific Advisory Committee has expressed "serious scientific concerns regarding the public health and welfare implications" of the PM2.5 NAAQS. BLM has previously recognized the need to analyze and disclose PM2.5 impacts that may result from coal mine operations, as it did in evaluating the proposed Red Cliff coal mine. That analysis, contained in a draft EIS, estimated likely PM2.5 emissions and levels predicted to result from the mine during its production phase, as well as those caused by mine construction. Both near- and far-field impacts were analyzed. The EA at issue here, however, fails to contain any analysis at all of the impacts to PM2.5 concentrations, an oversight that violates NEPA. The BLM must analyze and assess the direct, indirect, and cumulative PM2.5 impacts. **3. The EA Fails to Adequately Analyze the Mine's PM10 Impacts.** BLM should have analyzed and assessed impacts to PM10, or particulate matter less than 10 microns in diameter, which is currently limited by the NAAQS to no more than 150 micrograms/cubic meter over a 24 hour period. PM10, like PM2.5, can have harmful health impacts. The activities approved by the proposed BLM decision will lead to new construction at, prolonged operation of, and continued vehicle traffic to and from the Sage Creek coal mine, all of which will cause PM10	See amended Air Resources,15-37. See amended Cumulative Impacts Summary p. 52-58. The EA has been amended to include PSCM air permit information. See amended Air Resources p. 15-37.

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		emissions. As with PM2.5, BLM has recognized the need to disclose and analyze PM10 impacts in NEPA documents for coal mine proposals. In proposing the Red Cliff Mine and coal lease in Colorado, BLM prepared a draft EIS that addressed and analyzed the mine's potential contributions to PM10 emissions. BLM in Wyoming has also analyzed and assessed direct, indirect, and cumulative PM10 impacts prior to issuing coal LBAs. **4. The EA Fails To Analyze and Assess Impacts to Other Air Quality Standards** BLM also entirely failed to analyze and assess the impacts of the Sage Creek LBA to the following air quality standards. **1. 1-hour Nitrogen Dioxide NAAQS.** BLM failed to analyze and assess the potentially significant impacts to the current NAAQS for nitrogen dioxide. On February 9, 2010, the EPA finalized revisions to the nitrogen dioxide NAAQS, supplementing the current annual standard of 53 parts per billion with a 1-hour standard of 100 parts per billion. These NAAQS were originally proposed on July 15, 2009. *See* 74 Fed. Reg. 34404-34466 (July 15, 2009). These NAAQS became effective on April 12, 2010. Although the EA mentions the EPA's 1-hour NO2 NAAQS, BLM makes no effort to analyze and assess impacts. This is problematic because not only does the 2000 FEIS entirely fail to address any 1-hour NO2 impacts, but the EA discloses that the Sage Creek mine will release nitrogen dioxide. **2. Class I Increments** BLM failed to analyze and assess the potentially significant impacts to PSD increments for Class I areas. Increments are similar air quality standards to the NAAQS, although they apply based on whether an area is designated as Class I or Class II. Under the Clean Air Act, increments "shall not be exceeded." 42 U.S.C. § 7473(a). EPA has established Class I increments for PM10, nitrogen dioxide, and, most recently, PM2.5. In this case, BLM did not even address impacts to PSD increments for Class I areas. This is despite the fact that in other NEPA documents prepared by BLM for other coal leasing activities, such as the Red Cliff EIS, the agency has addressed such impacts. It is unclear why BLM here felt compelled to ignore the impacts to PSD increments, and indeed, there is no explanation in the EA as to why these air quality standards were overlooked. The oversight is significant given that there are several Class I areas near the proposed Sage Creek coal mine, including the Flat Tops Wilderness and Mt. Zirkel Wilderneess Area. Given that PSD increments "shall not be exceeded," BLM's failure to analyze and assess impacts to these air quality standards renders the decision to offer the Sage	"BLM is not required to consider remote and highly speculative impacts." (Coeur d'Alene Audubon Society, Inc., 146 IBLA 65, 70 (1998) (citing Trout Unlimited v. Morton, 509 F.2d at 1283).

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		Creek coal lease for sale and issuance arbitrary and capricious. **3. Visibility in Class I Areas** BLM has an affirmative duty to protect visibility in Class I areas under the Clean Air Act. Despite this, BLM did not analyze or assess how the Sage Creek coal lease would affect visibility in Class I areas, particularly areas near the lease. In fact, there is no mention in the EA of visibility impacts, despite the fact that development of the Sage Creek coal lease will certainly lead to the direct, indirect, and cumulative release pollutants that impair visibility, or create haze, including particulate matter, VOCs, and NOx. As BLM noted in the Red Cliff EIS: Examples of pollutants that directly contribute to regional haze include soot from diesel combustion, smoke from fires, fly ash from coal combustion, and windblown dust. Gaseous emissions that reduce visibility through the formation of secondary aerosols via chemical reactions in the atmosphere include emissions of SO2, NO2, and VOCs, resulting primarily from fuel combustion. Despite the fact that BLM analyzed and assessed visibility impacts in the Red Cliff EIS, BLM in this case made no effort to address such impacts. BLM, however, has an "affirmative duty" to protect such air quality values. See 42 U.S.C. § 7475(d)(2)(B). **D. The EA Fails to Adequately Analyze and Assess GHG Emissions and Climate Change Impacts** After dismissing such an analysis as "speculative," the Preliminary Final EA presents an analysis of the CO2 that will be produced by the coal mined under this action but this analysis is fundamentally flawed. The analysis, using average figures for U.S. facilities taken from the EIA, should present an approximation of the amount of GHGs that will result from the end use of the coal at the Sage Creek mine. Instead, the analysis drastically understates the potential impact. The EA presents figures of 1,168 metric tons of CO2E/year and 3,993 metric tons of CO2E total from coal combustion (as we are discussing CO2 emissions here those are actually the same as CO2/ year and CO2 total). The calculations that develop these figures are based on an assertions of production total and per year (this total production matches the figure presented in 167 These Class I areas are identified at 40 C.F.R. § 81.406. See 42 U.S.C. § 7476(d)(2)(B). while the annual production figure can not be confirmed) and a statement on the heat value content of the coal. That statement reads: "The coal is assumed to be low-sulfur compliant bituminous coal, with an average heat content of 12,802 dry British thermal units (BTUs) per ton." Unfortunately, the heating value for coals is typically stated in the BTU per *pound* not per *ton* range. *See e.g.* "Generating Electricity from Fossil	See amended Climate Change, p 56-57. See amended Air Resources, p. 15-37. The EA has been amended to correct this calculation.

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		Fuels" from the Colorado Governor's Energy Office, which cites a range of 10,500 to 15,500 BTUs per pound for bituminous coal (http://rechargecolorado.com/index.php/resources_overview/how_do_utilities_work/fossil_fuels). A reference was also identified that reports the heating value for the coal at the Foidel Creek mine at 11,250 BTU. As CO2 output from combustion is calculated here based on a EIA emission factor of 206.2 lbs CO2 per million BTU, the EA's figures are incredibly low. If these calculations are performed using the heat value content 12,802 BTU per *pound*, the emissions figures are quite different: 975,600 tons * 2,000 lbs/ton * 12,802 BTU/lbs / 1,000,000 * 206.2 lbs CO2/million BTU / 2204 lbs/metric tons = 2,336,989 metric tons CO2 per year 3,423,000 tons * 2,000 lbs/ton * 12,802 BTU/lbs / 1,000,000 * 206.2 lbs CO2/million BTU / 2204 lbs/metric tons = 8,199,583 metric tons CO2 total Such a fundamental error suggests that the BLM made a gross error and clearly raises red flags about other calculations and conclusions within the EA. After erroneously calculating the CO2 emissions that will result from combustion of the coal mined through this action, the EA then compares these emission figures to emissions figures from the U.S. and Colorado. The EA dismisses the CO2 from coal combustion as "negligible relative to potential impacts on global temperatures." Using the numbers calculated here, we assert that the CO2 produced by coal combustion is far from negligible. BLM must reanalyze the impacts of CO2 from coal combustion.	